

SOIL SAMPLES

Multi-Channel Analyzer

DATE

12/7/01

SIGNATURE

Dany Wincholt

STANDARD

197

BACKGROUND

15

RESULT

122

Standard: 787.9 pCi @ 51

2776 days = 290 pCi

@ 12/7/2001

$0.0158 \text{ pCi/g (for 150g)} \leftarrow = 1.93 \text{ pCi/g}$

$1.58 \times 10^{-8} \text{ nCi/cc} \leftarrow = 1.93 \times 10^{-6} \text{ nCi}$

	LOCATION	COUNTS	NET COUNT TIME	500 ml Marinelli BEAKER	nCi/cc. pCi/g SAMPLE	
					Wet	Dry
1	WELL (1)	108	33	150ml	5.2×10^{-7}	
2	WELL (2)	117	42	150ml	6.6×10^{-7}	
3	WELL (3)	91	16	150ml	2.5×10^{-7}	
4	WELL (4)	87	12	150ml	1.9×10^{-7}	
5	N1	14	6.5	108		1.4
6	N2	17	4.5	141		1.6
7	N3	7	—	127		—
8	N4	16	8.5	131		1.5
9	SS1	31	23.5	151		3.7
10	SS2	21	13.5	147		2.2
11	DP1	47	39.5	115		8.1
12	DP2	98	90.5	142		15.1
13						
14						
15						

RECEIVED

APR 22 2002

RADIOLOGICAL
HEALTH PROGRAM

BY

RECEIVED
APR 22 2002
RADIOLOGICAL
HEALTH PROGRAM

Reviewed by: WZK
Date: 1/24/2002

NEUTRON PRODUCTS, INC.

NAME: Danny Winchell

DATE: 12-7-01

TYPE: Waterborne

INSTRUMENT:

CAL DATE:

BKGD:

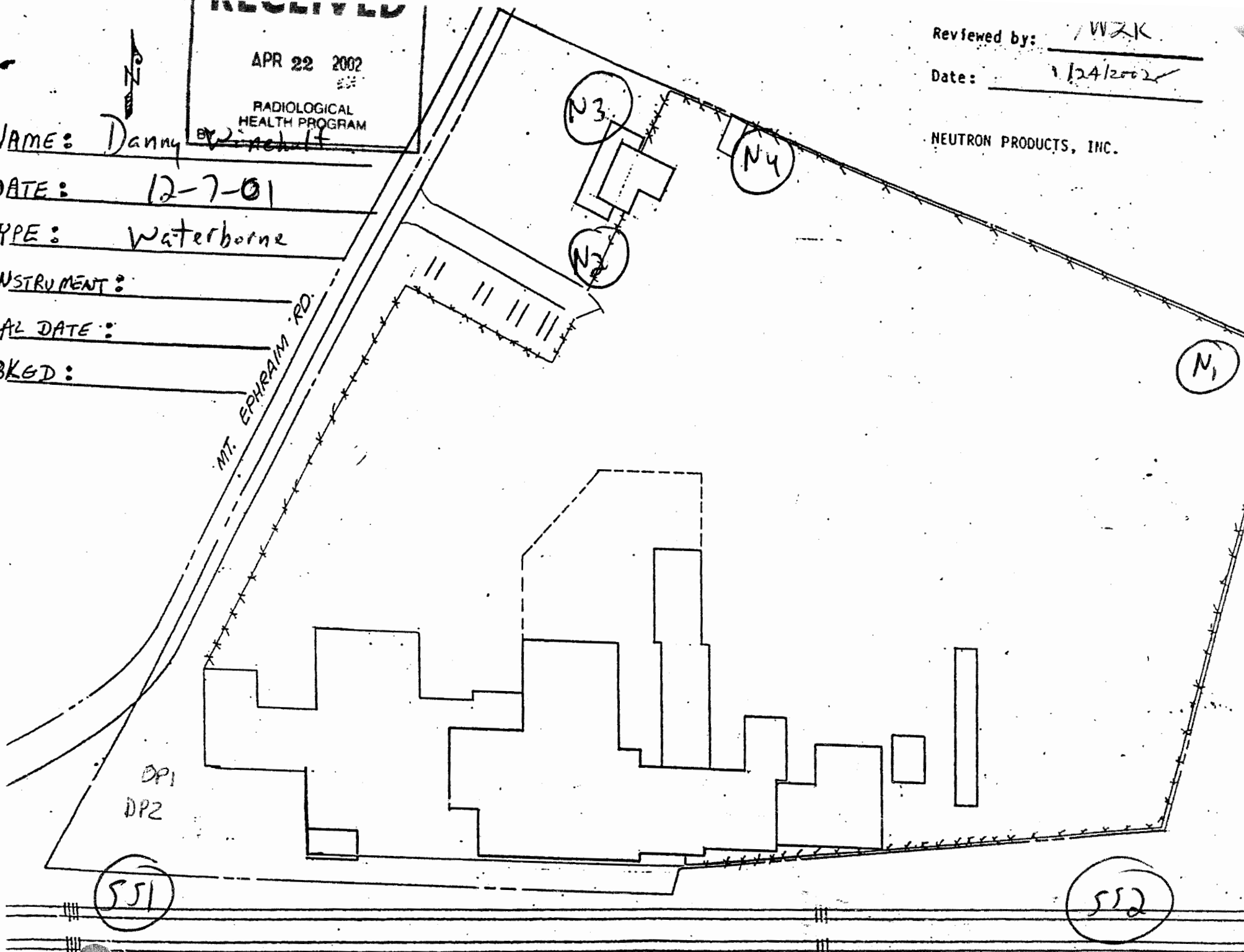
MT. EPHRAIM RD.

DP1
DP2

551

552

B&O RAILROAD



SOIL SAMPLES

Multi-Channel Analyzer

DATE

1/29/02

SIGNATURE

Danny Wirebolt

STANDARD

182

BACKGROUND

58

RESULT

124

284.3 pCi - 1/29/02

124 COUNTS = 2.3 pCi

	LOCATION	COUNTS	TIME	500 ml Marinelli BEAKER	SAMPLE	
					Wet	Dry
1	W1	75	17	150ml	2.6×10^{-7}	
2	W2	119	61	150ml	9.4×10^{-7}	
3	W3	60	2	150ml		
4	W4	69	11	150ml	1.7×10^{-7}	
5	N1	13	1.2	116		1.4
6	N2	7	1.2	127		.22
7	N3	10	4.2	147		.66
8	N4	11	5.2	151		.79
9	DP1	765	159.2	140		125
10	DP2	90	84.2	157		12
11	SS1	20	14.2	126		2.6
12	SS2	8	2.2	178		.28
13						
14						
15						

WATER

SOIL

1-

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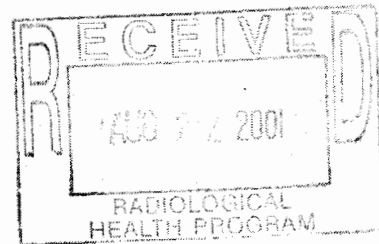
22301 Mt. Ephraim Road, P. O. Box 68
Dickerson, Maryland 20842 USA
301-349-5001 FAX: 301-349-2433
e-mail: neutronprod@erols.com

20 August 2001

Via FAX (410) 631-3198

Mr. Roland G. Fletcher
Manager
Radiological Health Program
Maryland Department of the Environment
2500 Broening Highway
Baltimore, MD 21224

Re: Licenses MD-31-025-01



Dear Mr. Fletcher,

This letter is in timely response to your letter dated July 26, 2001 which arrived here on July 30.

Alleged Violation #1 states:

"1. Section C.31(c) titled, 'Specific Terms and Conditions of License' and License Condition 22.B(2) which requires, in part, that all soils, wherever found contaminated by NPI licensed activities and exhibiting levels of cobalt-60 contamination exceeding 8 picocuries per gram above background must be removed by NPI and properly stored/disposed of as radioactive waste:

"Contrary to Section C.31 and License Condition 22.B(2), NPI failed to remove cobalt-60 contaminated soil exceeding the above-specified limit. Specifically, on September 20, 2000 RHP inspectors collected soil samples at sites located both on and off of the NPI facility. Maryland Radiation Laboratory sampling results from these samples indicated that of the 10 samples taken, all indicated soil having cobalt-60 concentrations exceeding 8 picocuries per gram. The range was from 28 - 610 picocurie per gram of soil. NPI failed to remove the contaminated soils from the areas exceeding the license limit. This is a **REPEAT** violation from the Departmental inspection of November 1999 and September 2000. Furthermore, NPI has still not removed the soil contaminated with cobalt-60 from the adjacent railroad property to establish compliance with the 8.0 picocurie per gram concentration limit. Monthly soil samples collected and analyzed by NPI personnel in February, March, April and May 2001 indicate that soil concentrations continue to exceed the license limit. The Stipulation and Settlement (Civil Case No. 76639 in the Circuit

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Court of Montgomery County) dated January 3, 1994 required NPI to clean these contaminated areas by June 15, 1994. NPI has missed this deadline and has refused to remediate this property."

Response

1.1 As a preliminary matter, from the wording of the alleged violation ("of the 10 samples taken, all indicated [contamination]") a person unfamiliar with our facility could get the impression that the entire property is contaminated and that, wherever one puts a shovel in the ground, one will find contamination. Clearly, that is not the case. In fact, monthly samples taken from randomly selected areas around the plant rarely show unexpected areas of contamination. It is well known to the Department which areas are contaminated and it is only those areas which were sampled during the referenced inspection, so it is not surprising that all of the samples exhibited some degree of contamination.

1.2 Secondly, your statement that Neutron "missed ...[the June 15, 1994]...deadline and has refused to remediate this property" is materially misleading. Specifically, it is well known to the Department:

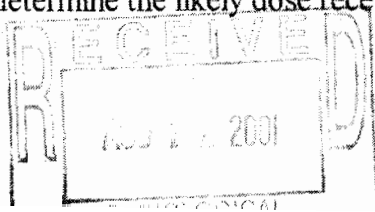
that Neutron performed its periodic removal of contaminated soil from the dry pond and the areas downstream thereof, and cleaned both the downstream rip-rap and the upstream stone trap at the earliest practical opportunity that spring, which had been unusually wet;

that the effort resulted in a substantive, and far more than ALARA optimum, reduction of radioactivity throughout the area of interest; and

that no additional work was either required by the settlement or likely to benefit persons, property or the environment in any credible way.

1.3 Neutron is appealing the validity of this license condition, largely because it is much more stringent than applicable state and federal regulations for an operating facility, without any demonstrable public health and safety or environmental benefit. While there does exist a very low level of radioactive contamination in the modest sized areas at issue, the most recent area survey shows that the highest dose rate in the area is approximately 0.06 mrem/hr., which is about 3 % of the regulatory limit of 2 mrem/hr for dose rate in an unrestricted area. In addition, it is important to keep in mind that less than 70% of the waist-high dose rate in the most contaminated area is due to contamination, with the balance due to skyshine and natural background. A comparison of the regulatory limit with the dose rate in the affected area is graphically demonstrated in Figure 1.

1.4 In accordance with good health physics practices, Neutron has performed several evaluations to determine the likely dose received by any member of the public from the



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contamination referenced in Alleged Violation #1. Such evaluations have repeatedly shown that it is not credible that any member of the public could receive in excess of 2 mrem/year from the referenced contamination, a mere 2% of the limit set by duly promulgated regulations for annual exposure to members of the public, and less than 1% of average sea-level exposure from nature. RHP has never disputed these evaluations, nor are there any grounds for dispute of which Neutron is aware.

1.5 Moreover, your citation materially misrepresents the Stipulation and Settlement of 1994. As you well know, the referenced terms of settlement render the cited license condition unenforceable until 60 days after the courtyard has been enclosed, an event that has been indefinitely delayed by acts and omissions of MDE.

1.6 Finally, the written Stipulation and Settlement was supplemented by an oral agreement which provided that even after the source of continuing contamination has been removed, the level of decontamination then required shall be governed by ALARA because:

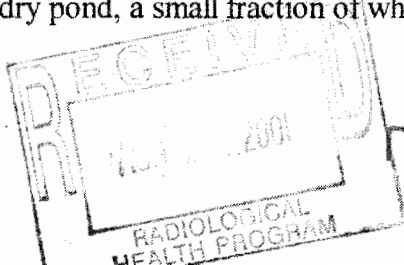
- the levels of contamination do not present any credible health and safety concern, nor do they result in dose rates which even approach regulatory limits of 2 mrem/hr in any unrestricted area and 100 mrem/year of exposure received by any member of the public; and,

- for whatever reason, the abandoned rail spur area has acted to remove contamination from the stormwater, thereby helping to prevent its spread downstream, and unnecessary disturbance of the rail siding could lead to contamination (however inconsequential) moving further downstream.

Corrective Action

1.7 Because the construction of the Courtyard Enclosure has been stymied by the concerted efforts of MDE and a few vocal members of the community, Neutron has undertaken alternative means of reducing the very low levels of contamination leaving the site. As a result, the contamination along the abandoned rail siding has been substantially reduced even before the courtyard has been enclosed. The alternative measures have primarily focused on reducing the amount of incidental contamination reaching the courtyard, and improving the efficiency of the stone trap and dry pond lying between the open courtyard and Neutron's southwest property line.

1.8 As RHP is well aware, since well before 1994 Neutron has, on numerous occasions, removed contaminated soil from the dry pond and areas downstream thereof. In addition, we have periodically cleaned portions of the stone trap in order to reduce the amount of contamination reaching the dry pond, a small fraction of which moves downstream therefrom.



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1.9 Furthermore, we have invested in, and initiated the use of, a nuclear grade vacuum cleaner (with HEPA filter), the use of which is intended to reduce the amount of removable contamination within the LAA, thereby further reducing the amount of contamination reaching the courtyard and, ultimately, the drypond.

1.10 Our efforts also include periodic remediation of contaminated areas. Regarding your reference to the soil samples collected in September, 2000, our remediation efforts have been focused on the areas with the highest levels of contamination found during that inspection, namely the drypond. At the time of your most recent inspection, we had conducted some remediation of that area (as well as some areas downstream thereof), and you are well aware that our efforts in that regard are ongoing. Since your inspection, we have continued to remove contaminated soil from that area.

1.11 Over the years, all of these efforts have proven effective in reducing the dose rates along the referenced rail siding, as is depicted graphically in Figure 2. Jeffrey Williams and Bill Ransohoff will be responsible for ensuring that these corrective action efforts continue.

Corrective Action Requested of MDE

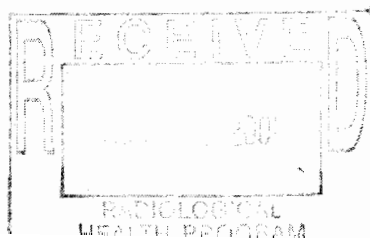
1.12 We are both well aware of the facts and allegations:

that MDE has never justified the excessive stringency of what has become ERLC 22.B(2), nor has Neutron ever agreed that compliance with it is practical until the LAA Courtyard has been enclosed, perhaps not even then;

that MDE agreed in July, 1989 that Neutron had achieved "substantial compliance" with that and other excessively stringent ERLCs then imposed by MDE upon its 01 License, and that it would "work with Neutron" on any of the ERLCs then imposed, the full compliance with which Neutron believed to be illegal or impractical;

that instead of performing as promised in that regard, MDE sought to enforce the letter of all the ERLCs then imposed, citing Neutron for alleged violations of no credible consequence to the public health and safety, demanding the payment of \$60,000 in allegedly "reduced" fines, with every indication of more to come, and suing Neutron for more than \$90 million when Neutron refused to succumb to MDE's unreasonable demands;

that in the course of said litigation, MDE sought the support of NRC Headquarters for the justification of its extraordinary stringency circa 1993, only to be turned down by letter dated January 4, 1994;



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that instead of either adjusting your policies, ERLCs, and demands accordingly, or otherwise working with Neutron to implement more practical License Conditions that merely require compliance with duly promulgated regulations, you have continued to cite and fine Neutron for its failure to comply in full with License Conditions far more stringent than ever justified by either NRC or MDE, and have either retained or made more stringent each of the ERLCs that have yet to be justified on the merits; and

that you have done so in egregious defiance of both the spirit and the letter of Executive Order 01.01.1996.03 which requires you to rigorously justify any regulations (which you have always insisted include License Conditions) more stringent than their federal counterparts.

1.13 The time has long since passed for MDE to either rigorously justify or relax the excessive stringency of ERLC 22.B(2); and after you have done so, we would be pleased to work with MDE as necessary to define a License Condition duly mindful of the public health and safety, with which it is practical for Neutron to comply.

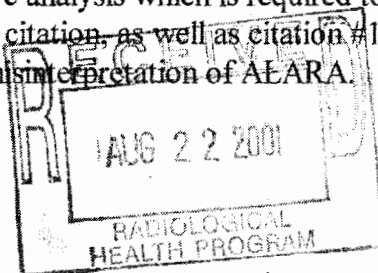
Alleged Violation #2 states:

"2. Section D.101 titled, 'Radiation Protection Programs' states that in addition to complying with all other provisions of these regulations, a licensee shall use all means to maintain radiation exposures and releases of radioactive material as low as reasonably achievable (ALARA):

"Contrary to Section D.101, the licensee failed to use all means necessary to maintain release of radioactive material as low as reasonably achievable. Specifically, NPI has failed to use means necessary such as the adequate containment of radioactive materials, proper waste storage practices and regular shipments of radioactive waste, to a licensed repository. One only has to review the soil sample results referred to in violation #1 to determine that NPI is not maintaining control over their radioactive material and it is continuing to be released. In spite of curtailed source-manufacturing activities, NPI continues to release cobalt-60 into the environment in an uncontrolled manner."

Response

2.1 The dispute between Neutron and MDE regarding ALARA is well documented. Neutron submits that it arises primarily out of MDE's working interpretation of ALARA to mean "as low as possible", thereby effectively reducing to zero all numerical regulatory limits and removing the need for any quantitative analysis which is required to determine what is "reasonable" as defined in NUREG 1530. This citation, as well as citation #1 are illustrative of the severe damages arising from MDE's insistent misinterpretation of ALARA.



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2.2 Both Neutron and MDE agree that, in addition to complying with numerical limits in the regulations, licensees must also keep personnel exposures and releases of radioactive material ALARA. In this case, Neutron is in compliance with the numerical limits, such as radiation dose rates in unrestricted areas, doses received by members of the public, etc., so that ALARA clearly applies.

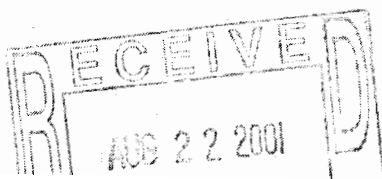
2.3 However, in order to perform an ALARA analysis to determine whether or not a licensee must further reduce releases or exposures, some dollar figure must be assessed to a person-rem of exposure saved, so that the cost of a particular proposed action can be compared with the benefit to be realized by the performance of that action. NUREG 1530 states that 1 person-rem of exposure saved is equivalent in value to a monetary cost of \$2,000. In other words, if the licensee can reduce personnel exposures by 1 person-rem by taking action which costs \$2,000 or less, then the ALARA clause of the regulations requires that licensee to take that action. If the action would cost more than \$2,000 per person-Rem saved, the licensee is not so obligated.

2.4 In this case, MDE is claiming that the soil sample results discussed in alleged violation #1 constitute *prima facie* evidence of an ALARA violation. However, Neutron has repeatedly shown that the person receiving the highest dose from the contaminated soil receives less than 3 millirem per year therefrom. For the purposes of this analysis, assume that the cumulative exposure attributable to the soil for all members of the public is 10 mrem/year, a number which is higher than credible. If Neutron could entirely eliminate its releases and remove all of the contaminated soil, as MDE requires, then it would reduce exposures by 10 mrem/year. Using the \$2,000 per person-rem figure provided in NUREG 1530, ALARA dictates that if Neutron could do this for less than \$20 per year, it is obliged to do so.

2.5 In fact, even though there is no off-setting public health and safety benefit to be derived therefrom, by the measures noted in 1.5 through 1.8 above, Neutron has devoted many times the \$20/year of human and material resources required by ALARA in a dedicated effort to ameliorate its inability to comply with the extra-regulatory license condition at issue here (22.B).

2.6 MDE also claims that Neutron's shipment of radioactive waste is not ALARA. Again, MDE's claims are not supported by facts or analysis. Neutron's previous analysis was based on experience gained during the two significant RadWaste shipments of 1990, during which Neutron employees received more than 60 person-rem of exposure. The schedule proposed by MDE in License Condition 21 would require several similar shipments, thereby causing Neutron's employees to incur significant additional occupational exposure. Neutron estimates that, as a result of these shipments, approximately 0.5 person-rem/year of public exposure would be saved. Thus, MDE's requirement would be clearly counter-ALARA based on radiation exposures alone, and when monetary costs are factored into the equation, it would be even more so.

2.7 Again, the measures which Neutron has taken over the past few years have been effective



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at steadily reducing both the material exposures of employees and the inconsequential exposures of members of the public. The data for the past several years of the Dickerson resident receiving the highest exposure from Neutron's operations are presented graphically in Figure 3. The significant decrease in the year 2000 is primarily attributable to the North Waste Room reorganization conducted in December, 1999 at a cost in terms of employee exposures and dollars expended which was much higher than justified by ALARA.

2.8 We are concerned by MDE's final statement in alleged violation #2, which reads:

"In spite of curtailed source-manufacturing activities, NPI continues to release cobalt-60 into the environment in an uncontrolled manner."

From this statement, it appears that MDE believes that the best way to eliminate the release of off-site contamination is to minimize Neutron's source fabrication activities, a pretext which has no factual support and which leads MDE to acts and omissions which violate the Atomic Energy Act, Section 8-102 of the Environment Article, and Executive Order 01.01.1996.03. Neutron's alternative approach, which has been to attempt to reduce the amount of contamination in the LAA and to improve the efficiency of the portions of the facility designed to capture that contamination if it does leave the courtyard, allows Neutron to operate its business in moderate-to-wide margin conformance with the regulations (including ALARA) prudently directed to protecting the public health, employee safety and the quality of the environment without unduly discouraging the production and use of atomic energy in the public interest.

Corrective Action

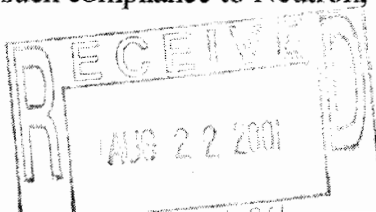
2.9 Although not obligated to do so by ALARA as described above, Neutron will continue its efforts to further reduce its inconsequential releases of radioactive material and exposures of members of the public. However, it cannot do so in good conscience at the expense of significant, unnecessary radiation exposures of its own employees, or unreasonable financial cost. The ALARA program will continue to be administered by the Radiation Safety Officer for the -01 license and reviewed by top management.

Corrective Action Requested of MDE

2.10 We respectfully suggest that MDE perform a cost-benefit analysis to quantify:

the benefit to the public health and safety (at \$2,000 per person-Rem saved) to be derived if Neutron were to literally comply with the limits imposed by ERLC 22.B(2); and

the cost of such compliance to Neutron, vis-a-vis its cost of maintaining a more or



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less status quo rate of decrease by the performance of periodic stone trap, dry-pond and downstream soil removal, and rip-rap decontamination maintenance.

We are confident that the result would be edifying to MDE, to the Dickerson public, and to the NRC and EPA, and we would cheerfully cooperate in such an effort to whatever extent is required to effect a constructive and eye-opening result for all interested parties.

Alleged Violation #3 states:

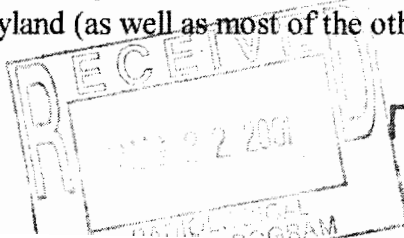
"3. Section C.31 titled, 'Specific Terms and Conditions of License' and License Condition 21.B requires that within 90 days of the issuance of the license, NPI must submit to the Department for approval a comprehensive plan for disposal of all low level radioactive wastes in accordance with those specifications defined in this condition:

"Contrary to Section C.31 and License Condition 21.B, NPI's low level radioactive waste plan was submitted to MDE on December 10, 1999; however, upon review it was found to be inadequate and as of this date a comprehensive plan acceptable to the Department has not been submitted. Deficiencies in the plan were discussed in a Departmental letter dated March 20, 2000, but NPI has not adequately responded to it. On October 20, 2000 the RHP received NPI's Decommissioning Plan dated October 27, 2000 which included a planned schedule for radioactive waste shipments. The RHP has reviewed this plan and determined that it is inadequate because it does not demonstrate compliance with the current radioactive material license waste disposal criteria. Table 2.1 of this plan describes a 12 year shipment schedule for only a small fraction of the total activity of current radioactive waste inventory. The plan did not describe the shipment schedule and protocol for the contaminated soil in storage. All radioactive waste that was generated prior to August 1999 is required to be shipped for disposal by August 2004. This is a **REPEAT** violation from the Departmental inspection of November 1999."

Response

3.1 As you know, Neutron is contesting this license with particular emphasis upon Condition 21 because, as written, it would cause Neutron to incur inordinate financial costs and expose its employees to unnecessarily high levels of radiation exposure, thereby forcing Neutron into clear violations of ALARA as defined in both NRC and Maryland regulations. At the present time, Neutron recognizes that this license is in effect, it is attempting to abide by those conditions which it is practical to satisfy, and we will require State cooperation for those which cannot be satisfied.

3.2 The only facility currently available for much of our RadWaste is the Chem-Nuclear facility in Barnwell, South Carolina, and its continued availability to Maryland licensees is far from certain. As you know, Maryland (as well as most of the other states in the country) has failed to



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comply with the Low Level Waste Policy Amendments Act of 1985 (the "LLWPAA") which obligated each state to provide disposal facilities for low level RadWaste generated within its borders or region. This failure on the part of the states has produced a tenuous situation which places our future ability to send RadWaste to Barnwell in doubt and which has emboldened the State of South Carolina to impose a tax on out-of-state RadWaste that is clearly designed to punish the licensees of other states for the failure of their State Governments to comply with the LLWPAA, and considerably increase the cost of disposal for licensees such as Neutron. Although we are encouraged by the attempts made by Envirocare of Utah to accept all Class A waste, they are not yet accepting such waste in their containerized Class A disposal cell, and they have not finalized their pricing structure.

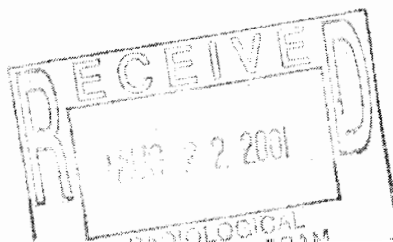
3.3 Despite all of the uncertainties, both the waste disposal plan and the decommissioning plan we submitted are practical, and explain how we would dispose of waste generated by continuing operations as well as waste currently on-site. We would welcome an opportunity to meet together with MDE, the NRC, and other appropriate parties to arrive at a mutually agreeable remedy.

3.4 It is true that although Table 2.1 of the decommissioning plan addresses the largest volume component of Neutron's RadWaste inventory, it only addresses a small fraction of the activity component of that inventory. This is primarily due to the high curie surcharge associated with disposal at Barnwell, which is structured in such a way as to encourage licensees such as Neutron to maximize the extent of disposal by decay and minimize the number of shipments. For example, as graphically illustrated in Figure 4, the cost of one shipment containing 4,500 Ci has a small fraction of the surcharge associated with 90 shipments containing 50 Ci each, as suggested at one time by MDE. Thus, Neutron has planned the "Big Shipment" at the end of its decommissioning plan, rather than a series of moderate activity shipments in the interim. Such an approach is clearly ALARA because:

most of the activity at issue is encapsulated and stored in pools and canals where it is well-shielded and contributes nothing to the radiation dose rate or the level of risk within the facility or in the community;

any time we ship significant amounts of high activity waste, we are likely to incur increased personnel exposures, so consolidating all the high activity waste in one such shipment helps to minimize personnel exposures; and,

allowing the waste to decay for as long as practical before shipping it for disposal will reduce the occupational exposure of our employees in preparing the shipment, reduce the hazards of the transport itself, and will reduce the handling hazard and any associated occupational exposure at the disposal site.



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3.5 In this NOV, MDE is insisting that all RadWaste generated before August, 1999 be shipped by August, 2004. By taking this inflexible position, MDE puts Neutron in an impossible situation because either it must defy MDE's wishes and not ship all of its waste by that deadline, or it must violate the ALARA provision of the regulations and cause its employees to incur significant, unnecessary, easily avoidable radiation exposures and cause itself to incur unbearable financial costs. Given that choice, we will risk the license violation to the extent required to conserve our material and human resources at no credible risk to the public health and safety. Preferably, as you know, we will appeal this and other extra-regulatory license conditions to higher authorities as necessary and, in the interim, we are always available to negotiate genuinely practical alternative License Conditions.

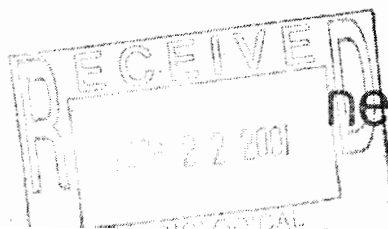
3.6 Regarding the shipment of contaminated soil, as MDE is aware, the contained activity is so low that the packaged soil provides effective shielding, and we have been using it in that capacity for several years. Among other things, it has been an effective tool in our efforts to reduce exposures to members of the public and our own employees.

3.7 Furthermore, guidance provided by the NRC in its License Termination Rule indicates that ALARA should be used when determining the extent of remediation and waste disposal to be conducted, including the oft-repeated statement that:

"[d]etermination of the levels which are ALARA must take into account consideration of any detriments, such as traffic accidents, expected to potentially result from decontamination and waste disposal."

An ALARA analysis shows that shipping the contaminated soil would cost a substantial amount of money with no off-setting radiation health benefit because shipment of all contaminated soil would actually increase dose rates both within the facility and in the community due to loss of convenient and inexpensive shielding. When other detriments (such as the increased potential for traffic accidents) are considered, the ALARA analysis recommends even more strongly against shipping the soil for disposal, as distinguished from allowing it to decay to inconsequence and using it constructively in the interim.

3.8 That said, in order to attempt to satisfy what it considers to be unreasonable demands on the part of MDE, Neutron has been in discussion with Envirocare regarding the possible shipment of contaminated soil and, in the event that becomes necessary or desirable, Neutron has provided for such shipments in its decommissioning plan. RHP's insinuations that unshipped RadWaste constitutes an ALARA violation are strongly contradicted by available data which indicates that both occupational and public exposure have been significantly and more or less continuously reduced over the last 5 years pursuant to Neutron's much more viable approach to both ultimate decommissioning and interim waste disposal.



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Corrective Action

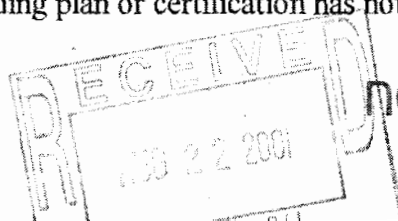
3.9 As you know, we will file an appeal with the Court of Special Appeals concerning the validity and appropriateness of this condition. We recognize this as a major point of contention between MDE and Neutron and we hereby request a face to face meeting, preferably in the presence of mutually agreeable people from NRC and DBED, to attempt to explain our position, better understand your position, and hopefully resolve our differences. Recognizing that your inspectors are not authorized to change this condition, in order to have a useful meeting, MDE top management should be present.

3.10 At some point, the State of Maryland may well have to come to grips with the consequences of MDE's errors and omissions in all of this, and at that point, it may well become as interested as Neutron in a truly viable approach to RadWaste Management and ultimate disposal. In that regard, we have presented a series of proposals, all arbitrarily rejected by MDE without well reasoned cause. Nevertheless, each of them were technically and economically viable in both the short term and long term, and were well designed to cope with the technical and economic uncertainties arising from the fact that the field of RadWaste management and disposal still lacks sound standards and effective competition for the safe and efficacious long term management and ultimate disposal of the type of RadWaste at issue between us.

3.11 Meanwhile, based upon inapplicable assumptions rather than a rational and clearly described plan of attack, your chosen consultants have proposed an inordinately expensive and destructive approach to the timely decommissioning of the facilities used under the 01 License, and have failed to consider and include much more viable alternatives. All things considered, we respectfully suggest that the public would be best served if you would accept our invitation for a meeting without further delay to discuss practical ways and means of making our clearly more viable alternative acceptable to RHP or some other regulatory authority more constructively inclined.

Alleged Violation #4 states:

"4. Section C.29(c)(2) titled, 'Financial Assurance and Recordkeeping for Decommissioning' requires, in part, that each licensee who is a holder of a specific license issued before October 15, 1998 and of a type described in paragraph (a) of C.29 must submit, on or before October 15, 1998 a decommissioning funding plan or a certification of financial assurance for decommissioning in an amount of at least equal to \$750,000. Also, the requirements of Section C.29(g)(2) requires that no person shall receive, possess, use, transfer, own, or acquire radioactive material of a type described in paragraphs (a) and (b) of C.29 for more than 180 days following the dates prescribed in the section for submittal of a decommissioning funding plan or certification, if the decommissioning funding plan or certification has not been approved by the Agency:



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"Contrary to Section C.29(c)(2), NPI has not met the \$750,000 certification by the specified dates of this regulation. Furthermore, NPI's decommissioning funding plan has not been approved by the Agency. Pursuant to NPI's failure to provide an adequate decommissioning funding plan or the \$750,000 certification by April 13, 1999 (180 days post October 15, 1998) NPI has continued to receive, possess, use, transfer, own, or acquire radioactive material of a type described in paragraphs (a) after the 180 day (April 13, 1999) deadline. This is a **REPEAT** violation from the Departmental inspection of November 1999 and the February 2000 [sic]."

Response

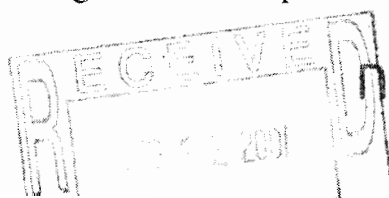
4.1 As MDE is well aware, its adamant refusal to replace C.32 with the NRC's License Termination Rule ("LTR") made it totally impractical for Neutron to post a cash equivalent deposit of \$750,000 as required by C.29(c)(2). Moreover, MDE's equally adamant refusal to adopt Appendix D prevented Neutron from complying with the financial assurance regulations, even though it had demonstrated the wherewithal to satisfy the financial strength requirements of the NRC's then newly adopted regulation.

4.2 Finally, had Neutron posted the required \$750,000 deposit, MDE's arbitrary rejection of its \$650,000 to \$1.3 million Decommissioning Plan, combined with MDE's ostensible adoption of its consultant's plan (estimated to cost of \$6.5 million to \$21 million) would have enabled it to demand that Neutron post an additional \$6 million to \$20 million of cash equivalent funding assurance or forfeit its \$750,000 deposit, a set of circumstances clearly designed to discourage both initial and continuing compliance.

4.3 Thus, we are contesting MDE's ongoing attempt (based on the provisions of C.29) to prematurely terminate our -01 License and confiscate our property without any credible prospect of benefit to the public health and safety or the environment. Initially, Judge McGuckian issued an Order as a result of a Hearing on our Cross Motions for Preliminary Injunction, under which we operated for nearly a year and a half to the well-demonstrated benefit of all affected parties including the State and its taxpayers.

4.4 Subsequently, MDE successfully prosecuted a Motion for Summary Judgment to obtain a Permanent Injunction preventing continued operations from being conducted under Neutron's -01 License. That Motion was modified by Judge Rupp to allow Neutron to continue to operate under conditions similar to those Ordered by Judge McGuckian, pending the outcome of its appeal; and we will continue to operate in accordance with those modifications to the best of our ability.

4.5 Regarding the decommissioning funding plan which has not been approved by the Agency, we submit that a face to face meeting to discuss the plan submitted by Neutron last October is



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long overdue and we hereby request such a meeting, preferably including prospectively helpful third parties and MDE top management, so that we can better understand each other's position and hopefully arrive at a practical course of action.

Corrective Action

4.6 Under all of the circumstances, the best corrective action we can take is to put the facility in a better position to be decommissioned and to put the company in a better position to perform that decommissioning (if, as and when it becomes necessary). Meanwhile, against all odds, we have continued to generate a positive cash flow, retire debt, improve the radiological condition of the facility, and demonstrate our on-going ability to self assure with the hope that, at some point, MDE will work with us to benefit the public interest, as is required by common sense, all duly promulgated laws and regulations, and its pledge as part of the 1994 Settlement.

Alleged Violation #5 states:

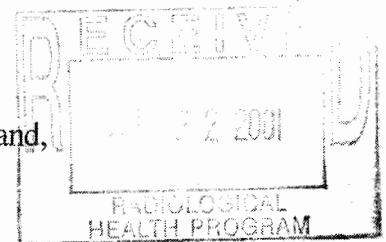
"Section J.11(a)(4) titled, "Posting of Notices to Workers" requires, in part, that the licensee post any notice of violation involving radiological working conditions and any response from the licensee.

"Contrary to Section J.11(a)(4), NPI failed to post their February 12, 2001 compliance response to the January 19, 2001 Departmental letter-Notice of Violation which described numerous violations found during the September 18-20, 2000 radioactive materials inspection."

Response

5.1 The provisions of Section J.11 require that employees have access to:

- applicable regulations;
- radioactive materials licenses, including amendments and incorporated documents;
- operating procedures;
- notices of violations, proposed fines, orders, etc.; and,
- our response to the notice of violation.



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As MDE is aware, proper postings have been made so that Neutron employees have access to the regulations, the licenses and the operating procedures. Specific to this alleged violation, the Notice of Violation itself, which described the violations, was posted on 4 different bulletin boards throughout the plant, providing ample access to all employees. While it is true that our response to those violations was not posted, copies of such documents are available to any employee requesting to see them.

Corrective Action

5.2 We will be more vigilant in our efforts to include our responses on the bulletin boards. Checking the postings on a monthly basis has been added to the corporate calendar and is the responsibility of Cathy Bupp.

Alleged Violation #6 states:

"Section D.101 titled, "Radiation Protection Programs" requires in part, that each licensee review the radiation protection program content and implementation at intervals not to exceed 12 months.

Contrary to Section D.101, NPI failed to conduct the annual review of the radiation protection program content and implementation for the calendar year 2000. Specifically, NPI has not conducted a review of the radiation protection program, content and implementation within the last 12 months."

Response

6.1 As MDE is aware, the review of the radiation protection program is an on-going process which is fairly extensive for the 01 license. The annual review for the year 1997 was completed on August 7, 1998; the report for the year 1998 was completed on August 7, 1999; and the report for the year 1999 was completed on June 2, 2000. The review for the year 2000 was completed on August 16, 2001. It is true that this is slightly more than 12 months since the last review. However, it is in keeping with the timeframe by which the review has historically been conducted.

Corrective Action

6.2 The review for the year 2000 has been completed, a copy of which is available for inspection.

6.3 In future years, the target date for completion of the annual review will be June 30, and the RSO for the 01 license will be responsible for ensuring that the review is completed on

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schedule.

Alleged Violation #7 states:

"Section D.302(b)(ii)(1) titled, "Compliance with dose limits for Individual Members of the Public" requires the licensee to show compliance with the annual dose limit for individual members of the public.

"Contrary to Section D.302(b)(ii)(1), NPI failed to demonstrate by measurement, or calculation, or appropriate simulation model that the total effective dose equivalent to the individual likely to receive the highest dose from the licensed source of radiation does not exceed the annual dose limit as described in Section D.301 for the calendar year of 2000."

Response

7.1 It is obvious to anyone making the most cursory review of the dosimetry and with knowledge of the pertinent facts as were afforded RHP during the inspection that not only was Neutron in wide margin compliance with the 100 mrem limit, but that dose to the most highly exposed cohort was significantly reduced from that experienced in 1999 and previous years.

7.2 In fact, such an evaluation was performed and included in Figure 3 of Neutron's letter to MDE dated February 12, 2001, which estimates the dose to the most highly exposed member of the public for the year 2000 to have been 43 mrem, if he had resided in the house at issue for the entire year, which he did not. So, as of February 12, MDE was aware that Neutron had performed the necessary calculations to demonstrate that it was in compliance with the annual dose limit as described in Section D.301 for the calendar year of 2000.

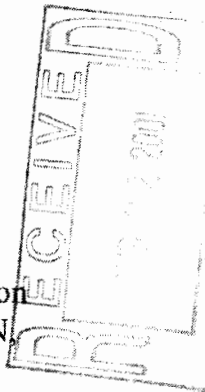
7.2 The final evaluation included in the annual review shows the highest exposed member of the public actually received 30 mrem for the year 2000.

Corrective Action

7.3 No corrective action is required. Please rescind the citation.

Alleged Violation #8

Section D.902 titled, "Posting Requirements" which requires the licensee to post each radiation area with a conspicuous sign or signs bearing the radiation symbol and the words "CAUTION RADIATION AREA" (CRA). Section D.902 requires the radiation symbol to use the colors magenta, purple or black on a yellow background.



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- a. Contrary to Section D.902 and D.901, NPI failed to post the required "CAUTION, RADIATION AREA" sign in the radiation area located near the windows of the welding shop.
- b. Contrary to Sections D.901 and D.901, NPI failed to properly post the radiation area located near the blue Sealand type container in the courtyard area of the LAA. The CRA sign was not conspicuous because it was rusted out and almost illegible. The sign did not have a yellow background and the radiation symbol was not visible.

Response

8.1 As MDE is well aware, the blue Sealand container is within the Limited Access Area and its contents are well known to the few people who have access to the container. Consequently, although the markings on the posted sign were worn, there were no potential adverse consequences as a result. The sign has now been reposted.

8.2 Due to preparations for the RadWaste shipment in June, some waste was temporarily stored in such a way as to increase the dose rate at the weld shop windows to above 5 mr/hr. We had been periodically surveying the area and the previous survey had shown the dose rates below 5 mr/hr, so the "Radiation Area" signs had been removed. However, they were evidently removed prematurely as subsequent developments again created radiation areas around the windows as your inspectors observed on June 13. Although the increased exposure received by weld shop personnel was minimal, in retrospect, the signs should not have been removed until the shipment had been made.

Corrective Action

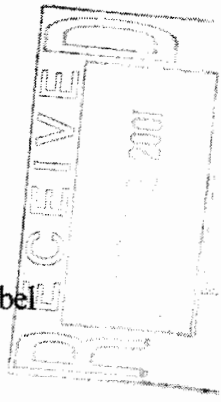
8.4 We have reposted the blue Sealand container and the windows in the weld shop were reposted until after the RadWaste shipment, at which time the radiation areas were no longer present. No additional corrective action is contemplated at this time.

Alleged Violation #9

Section D.902(a) titled, "Labeling Containers and Radiation Machines" requires in part, the licensee to ensure that each container of licensed radioactive material bears a clearly visible label bearing the radiation symbol and the words "CAUTION, Radioactive Material or "Danger, Radioactive Material".

NPI failed to properly label drums of soil containing cobalt-60 located in the courtyard area of the

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Limited Access Area with a clearly visible label bearing the radiation symbol and the words "CAUTION, Radioactive Material" or DANGER, Radioactive Material." Inspectors observed drums with no labels at all. Furthermore, the drums were stored outside, unprotected from the sun, wind, rain, snow, ice and extreme temperatures.

Response

9.1 As RHP is well aware, the contamination levels in the soil are so low that, far from being a source of increased dose rate, the drums of soil actually provide effective shielding. In addition, all of the drums are within the LAA, and the few people who actually have access to the drums are well aware of their contents.

9.2 That said, drums and/or areas have been relabeled in accordance with COMAR D.901-905.

9.3 In addition, inspection of the physical condition of the drums has shown their integrity to be intact, despite the visual appearance of rust on some of them.

Corrective Action

9.4 No additional corrective action is anticipated at this time.

Alleged Violation #10

Section D.501 titled, "Surveys and Monitoring-General" requires a licensee to make or cause to be made, surveys that are necessary under the circumstances to evaluate radiation levels, concentrations or quantities of radioactive material and the potential radiological hazards that could be present. License condition 22.C. requires NPI to conduct floor monitoring surveys on all surfaces within the facility outside of the LAA.

Contrary to the requirements of Section D.501 and License Condition 22.C, NPI failed to conduct floor monitoring surveys of the welding shop during the calendar year of 2000 and the first five months of 2001. Furthermore, no floor monitoring survey records of the welding shop were available for inspection.

Response

10.1 As RHP is aware, the original portal monitor used to frisk those leaving the LAA was designed to detect 1 μCi of contamination, which is the exempt quantity for cobalt-60.

Therefore, at that time it was not unusual or unexpected to find contamination less than 1 μCi

outside the LAA.

10.2 After RHP gave Neutron permission to install the new, much more sensitive portal monitor (the HECM) in 1989, our contamination control program was substantially improved. Initially, the monthly floor survey schedule made sense because we were still finding contamination which presumably left the LAA before the HECM was installed. However, it has now been more than 5 years since the monthly surveys have revealed contamination in the parts of the building outside the LAA attributable to ongoing LAA operations and we hereby request that the monthly requirement be changed to quarterly.

10.3 Regarding the specific violation, the weld shop is not part of the contiguous building floor plan upon which the floor survey schedule was developed and it was simply an oversight to leave it off the survey schedule. The area in question represents approximately 3% of the building area.

10.4 Furthermore, it is not as if the radiological condition of the weld shop is never assessed. In the fall of 1999, extensive smears were taken of surfaces in the weld shop and no contamination was found. Those records are enclosed for your review.

Corrective Action

10.5 A thorough floor survey was conducted in the weld shop. No contamination was found. In addition, the weld shop has been added to the routine monthly surveys. Cathy Bupp is responsible for ensuring that floor surveys are conducted.

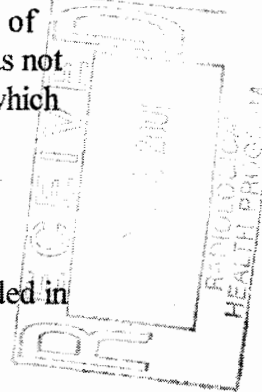
Alleged Violation #11

Section D.1101 titled "Records-General Provisions" requires the licensee to use units of becquerel, grey, sievert, coulomb per kilogram, disintegrations per minute, rad, rem and roentgen and clearly indicate the units of all quantities on records required by Part D.

Contrary to the requirements of Section D.1101, the results soil sample surveys dated February 1, and 21, 2001, March 9, 2001, April 25, 2001, and May 16, 2001 were maintained in units of gross counts instead of picocuries. Furthermore, the efficiency of the counting system was not documented on the survey records. As a result, the records did not identify the samples which exceeded the 8.0 picocurie per gram limit.

Response

11.1 Historically, data from the routine soil samples taken each month have been recorded in units of net counts per minute. Although this method does not distinguish cobalt-60 from



naturally occurring radionuclides present in the soil, evidence of cobalt-60 contamination was readily apparent simply due to increased counts. This method has been in use for several years and, as far as we know, has never been objectionable to RHP. However, we have now implemented a program to count the routine monthly soil samples using the multichannel analyzer, thereby allowing us to distinguish cobalt-60 contamination and use RHP's desired units of pCi/g.

11.2 In addition, when RHP inspectors expressed their desire to have the soil sample data expressed in pCi/g, Neutron representatives performed the necessary calculations within approximately 15 minutes for those samples which had been counted on the multichannel analyzer. These soil samples were in addition to the routine monthly samples referenced in the citation.

11.3 It is common health physics practice for certain types of surveys (e.g., "frisking") to be conducted with instruments reporting in counts per minute ("cpm"). In these cases the survey is used to indicate the presence of contamination by comparison to background and/or historical precedent. Such surveys are not used to establish exposure records or otherwise show compliance with regulatory limits and a requirement to reduce count rates to standard units is neither warranted, useful, nor generally practiced. These surveys are of a more qualitative than quantitative nature. Our monthly sampling of soil serves much the same purpose as a qualitative alert to the presence of contamination in unexpected areas, or unexpected changes in levels of contamination. Neither of these functions is necessarily better served by reporting in standard units.

Corrective Action

11.4 The health physics technician responsible for soil samples has been trained on the operation of the multichannel analyzer and the routine July samples were analyzed in that manner, so that the results are expressed in terms of pCi/g. Bill Ransohoff is responsible for ensuring that this practice continues.

Alleged Violation #12

Section C.31 titled "Specific Terms and Condition of License" and License Condition 17.A. require in part, a Health Physics Technician to ensure the proper use of the portal monitor, hand held frisker and any other devices employed to detect levels of radioactivity present on persons or items which exit the LAA. License Condition 37 and Procedure R 2029 dated June 14, 1989 titled "Procedure For Exit From The Limited Access Area" requires in part, for one to frisk themselves or have a Health Physics Technician frisk them at the pancake probe frisking station located at the entrance to the clean shower room. Procedure R 2028 dated February 7, 1991 requires in part, for one to verify that the rate meter and the pancake probe in the clean room is

operational prior to entering the LAA.

Contrary to the requirements of Sections C.31 and License Condition 17.A., the technician failed to ensure the proper use of the hand held frisker. The RSO failed to verify that the rate meter and the pancake probe located at the frisking station at the entrance to the clean shower room, were operational prior to entering the LAA. Upon exiting the LAA on June 13, 2001, MDE Inspectors identified that the hand held frisker was not operational, and it failed to respond to a radiation check source. Upon further review, it was determined that the detector was broken. Although a back up system was available, the RSO bypassed the clean shower room frisking station instead of replacing the defective detector. Then he walked through the clean shower room and used the frisking station located at the Helguson monitor.

Response

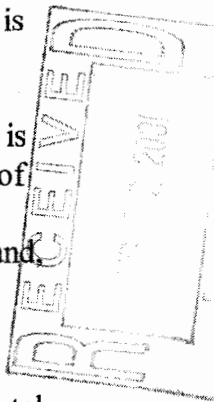
12.1 At the time of the inspection, we were preparing for the waste shipment and there was additional RadWaste temporarily stored in the LAA, thereby increasing the background in the cave. The RSO mistakenly attributed the higher readings on that frisker to those unusual circumstances and we appreciate RHP's role in identifying the actual problem.

12.2 However, we believe the seriousness of this infraction (and that of the RSO bypassing the clean shower room) should not be elevated to an actual violation for the following reasons:

- 1) by the time the LAA entrants reach the frisking station on their way out, they have already removed their coveralls and changed their shoe covers, so the most likely sources of contamination have been removed; and,
- 2) the effectiveness of this system is demonstrated every working day, when at least 6 smears are taken from the clean room/transition room area, which includes the entrance room, the HECM and shower area, the area around the frisker, and the transition room/locker room which borders the LAA proper. If any smear is found to have removable contamination in excess of the 440 dpm/100 sq.cm clean room standard, it is promptly decontaminated.

12.3 So, the cleanliness requirement throughout the entire clean room/transition room area is the same stringent standard of 440 dpm/100 sq.cm. Finding removable contamination in any of these areas is a rare event. Since there were 2 additional friskers located in the clean room in different locations, the RSO's decision to use one of the other ones was perfectly reasonable and by moving to one of the other frisker locations, he did not increase the risk of the spread of contamination in any material way.

12.4 Upon finding that the instrument was, in fact, not working correctly, the RSO immediately



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undertook an investigation and determined that the Ludlum 177 itself was sporadically malfunctioning.

Corrective Action

12.5 The ratemeter was returned to the manufacturer for diagnosis and repair, and, in the interim, was replaced with an alternate meter. No additional corrective action is contemplated at this time. Please rescind the citation.

Alleged Violation #13

Section C.31 titled, "Specific Terms and Conditions of License", License Condition 37 and Procedure 2028 titled "Procedure For Entrance To The Limited Access Area" prohibits eating, drinking, and smoking in all parts of the LAA. The June 23, 1988 Departmental Order states that the licensee shall immediately stop eating, drinking and smoking in the offices and work areas of the LAA.

Contrary to Section C.31 and License Condition 27, on June 13, 2001, RHP inspectors found evidence that NPI employees were feeding a cat and a litter of kittens in the courtyard area of the LAA. Specifically, the inspectors observed a plate with chocolate cake that was passed through a window from the welding shop into the LAA. The RHP inspectors instructed the RSO to remove the feline family from the LAA; however, on June 28, 2001 the cat and her litter were still living in this area where radioactive materials are stored.

Furthermore, on June 28, 2001 inspectors found evidence of food and drink in the Helguson monitor counting room, a room adjacent to and with direct access to the LAA. Specifically, a cracker wrapper was found on the floor and circular stained rings were found on the top of a cabinet. Also, disposable coffee cups, cracker wrappers and paper towels soaked in coffee were found in the waste can.

Response

13.1 The cat and her kittens were in an area of the LAA isolated from routine use, and unlikely to have appreciable levels of contamination. The kittens were trapped, counted out on the HECM, found to be free from contamination, and given a new home off the property. The cat was trapped, counted out on the HECM, found to be free of contamination, spayed, and returned to Dickerson.

13.2 Eating and drinking within the LAA, even the clean room, is not permitted. Knowing this, entrants to the clean room will often finish their snacks and/or drinks outside the door and throw

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the trash in the trash can in the clean room. This is not *prima facie* evidence of eating or drinking within the LAA.

13.3 If the clean room were contaminated to any extent, and if we had been experiencing a significant number of ingestion incidents, then there might be some basis for RHP inspectors to sift through our trash in an effort to establish a causal violation. However, considering the circumstances which have actually existed for several years, focusing inspection efforts on such minutiae is terribly counterproductive for our Radiation Protection Program because it degrades our regulators and forces us to divert our attention from what could be a significant radiological issue to something which so clearly is not.

Corrective Action

13.4 No additional corrective action is contemplated at this time, other than to respectfully request that this citation be withdrawn.

Alleged Violation #14

Section C.31 and License Condition 21.B.5. require NPI to provide the RHP and MDE's Hazardous and Solid Waste Management Administration copies of radioactive waste shipment records within 14 days of shipment date.

NPI failed to provide the RHP and MDE's Hazardous and Solid Waste Management Administration copies of the June 23, 2001 radioactive waste shipment records within 14 days of shipment.

Response

14.1 After making the shipment, we reviewed the COMAR regulations and found no notification requirement. However, as correctly cited above, there is such a requirement in our license. When the RHP inspector called to request the information, it was promptly faxed to him.

14.2 The RHP inspection occurred on June 13 and June 28, between which dates we made the referenced waste shipment. We made no secret of the shipment and RHP was well aware of it during the second day of the inspection. Yet instead of requesting the information at that time, the inspectors waited until the 14 days had passed so that an NOV could be issued.

Corrective Action

14.3 The required documentation has been sent to RHP. No additional corrective action is

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contemplated at this time. Kindly downgrade the citation to an observation.

Concern #1 states:

"NPI possesses five (5) teletherapy heads with 'stuck' cobalt-60 sealed sources (in the shielded position) located in the courtyard area of the Limited Access Area (LAA). Please include with your compliance response, what NPI plans to do about this situation. Include what measures will be taken to try and recover the sources or plans for disposal of the units. Radioactive material once determined to be useless and of no demonstrated economic value, is considered waste and should be treated accordingly. Furthermore, NPI currently stores in the main pool stellite corners containing approximately 25,000 curies of cobalt-60. Since this material does not have any apparent economic value, it should be declared as radioactive waste and shipped for disposal within four (4) years in accordance with license criteria."

Response

C1.1 We have not yet performed the additional work required to attempt to extract the 'stuck' sources, but will do so at our earliest opportunity consistent with other priorities. We expect to get them into the cell during the next few months.

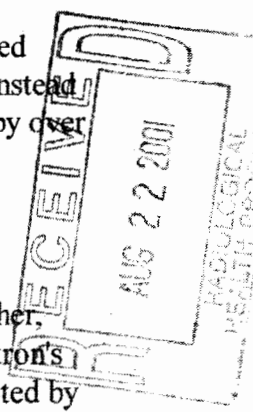
C1.2 Although MDE has prevented us from making useful sources out of the stellite bearings as we had originally intended, we have resumed our efforts to explore the feasibility of revitalizing the stellite program. Clearly, the program should be supported by MDE as it would convert hundreds of thousands of curies of radioactive material, now considered to be RadWaste, into useful sources.

Concern #2 states:

"Inspectors identified poor radioactive waste storage practices and conditions such as rusted drums, drums lacking retaining rings, open waste containers, waste stored in plastic bags instead of drums, inadequate containment of contamination and eight (8) damaged drums caused by over compaction."

Response

C2.1 Inspectors did not "identify" eight damaged drums, nor did they inspect them. Rather, they falsely concluded that slight irregularities in some drums previously identified by Neutron's internal reviews were significant, despite the fact that further evaluation previously conducted by Neutron verified that the package integrity was not affected. Furthermore, there is no evidence



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that the irregularities in the drums were caused by "overcompaction", as Neutron's use of the compactor is in compliance with the manufacturer's instructions and specifications.

C2.2 Due to the nature and very low activity of the RadWaste in "rusted drums" and "drums lacking retaining rings", etc., Neutron submits that these issues do not represent a health or safety issue. However, Neutron also recognizes the benefits of improving the appearance of this portion of its facility and will undertake to do so in the coming months.

Concern #3 states:

"On June 13, 2001, NPI personnel issued MDE Inspectors written safety instructions that were missing pages 2, 4 and 6 of 7 pages."

Response

C3.1 The safety instructions had formerly been printed on both sides of the page, and, the copies given to the Inspectors were only copied on one side. We appreciate RHP's assistance in identifying this error.

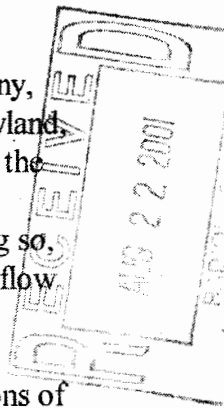
C3.2 Those packets with missing information have been removed and replaced with packets containing complete information.

Concern #4 states:

"It appears that NPI does not have the sufficient trained personnel, financial resources and commitment of management necessary to establish compliance with Maryland Regulations, License conditions and Court Orders."

Response

C4.1 As summarized in part C4.3, the management and employees of this tiny little company, only four in number when it accepted the invitation of Montgomery County to move to Maryland, has, with a paid in capital of less than \$2 million, created, developed, maintained and applied the human and financial resources reasonably required to safely and successfully implement the constructive purposes of the Atomic Energy Act of 1954, As Amended (the "Act"). In doing so, it has generated more than \$175 million in gross revenues and more than \$20 million in cash flow which it has reinvested in plant, processes, equipment and human skills which it has used to produce goods and services that extend and/or upgrade the lives of millions of end-use beneficiaries to whom the retail value of said goods and services have been worth many billions of dollars.



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C4.2 Conversely, as documented in part C4.4, your program has imposed upon our operations excessively stringent, inordinately expensive, and counterproductive policies, practices, regulations, license conditions and Court Orders which do nothing to advance the public health and safety, while deny this company, its employees and all who depend upon it the legitimate fruits of our endeavors.

C4.3 The Salient Facts of Neutron's Performance Under The Act

C4.3.1 During the past thirty-five years, the management and senior staff of this company, and the employees we have hired to help us, have designed, developed, financed, built, operated, maintained and managed the complex equipment and processes required to work safely and efficiently with industrial quantities of potentially hazardous radioactive materials and chemicals to produce and deliver good and valuable products and services, all of which have extended and/or improved the quality of life for millions of people here and abroad in one way or another.

C4.3.2 Although a few of our employees have suffered conventional workplace injuries, and property damage, injury or death from the motor vehicle accidents that abound in our society, we have produced and delivered the products we make and the services we render without suffering a single radiation or chemical injury or illness in the course of several million person-hours devoted to working intensively with, and/or in the immediate vicinity of, the potentially hazardous materials which we have safely managed and used to produce and deliver a wide variety of useful products and services, each of which requires extensive quality control and quality assurance.

C4.3.3 Nor have we ever endangered our neighbors, or adversely impacted the quality of our environment (or theirs) in any credible way. In fact, we are relatively unique in the success of our experience. Whatever our shortcomings, they haven't resulted in a stuck source, an irradiator fire, a carrier-source collision, or a personal injury arising out of an entry to a hot cell or radiation processing plant. Nor have we experienced serious mishaps in the transfer of cancer therapy sources, or delivered radiation processing sources that have rusted, suffered serious pitting corrosion, or failed in routine service. Nor have those treated with our cancer therapy equipment suffered fatal accidents. Nor have our employees been seriously exposed by entering high radiation fields without due care. Nor have we released radioactive materials or chemicals to the environment in quantities, or under circumstances, that could conceivably be hazardous to persons or property.

C4.3.4 Moreover, there are few, if any, companies in our field that have not suffered, or been responsible for, one or more of the significant mishaps listed above. In fact, one of the reasons such a small and lightly financed company as Neutron has survived, is that we have a good record among those who have relied upon us, for safety, quality, reliability and the ability to commercialize genuine advances in the art of what we do.

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NEUTRON PRODUCTS Inc

C4.3.5 Finally, where physically possible, we have always sought to establish and maintain a wide margin of compliance with duly constituted regulations, and, with rare and inconsequential exception, we did so until the limits changed a few years ago. Moreover, even under the new regulations, we manage to maintain decent-to-wide margins of compliance with all applicable and duly promulgated regulations, and - with RHP's cooperation - we could further improve our margins of compliance.

C4.3.6 We did not achieve the record cited above by accident, or by failing to timely address matters of genuine importance that were ours to control; and on such occasions, we have had little or no disagreement with you or any other regulator at the outset of those instances where one of us has directed the attention of the other to a genuine deficiency, however large or slight, in Neutron's program, plant or equipment. Rather, we have responded to all such occasions (and there have been several of substance) with candor, skill and alacrity, being careful to:

accurately determine and assess relevant facts; and,

evaluate the alternatives available to us, always seeking to optimize the inherently competing interests of safety, efficacy and economic viability.

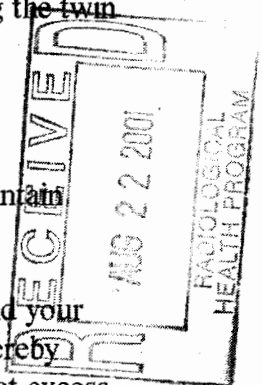
C4.4 The Salient facts of MDE's Performance Under The Act

C4.4.1 Fundamentally, MDE has the right and duty to regulate Neutron as reasonably required to protect public and employee health and safety without unduly discouraging the use of atomic energy in the public interest, and we respectfully submit that MDE has failed to perform on both obligations. Specifically with regard to the public health and safety, by adopting the twin doctrines (both of them false):

- a) that there is no safe level of exposure to ionizing radiation; and
- b) your interpretation of the principle of ALARA to require licensees to maintain radiation exposures As Low As Possible, regardless of the cost

you have effectively rationalized the negation of all regulatory limits, and put yourself and your inspectors in a position to be only as satisfied with licensee performance as you wish, thereby establishing a realm that is inherently arbitrary and capricious. Then, expanding upon that excess, you have imposed upon our 01 License, but never justified, Extra Regulatory License Conditions ("ERLCs") that have placed us in a more or less permanent state of non-compliance with the ERLCs throughout a period in which, with rare exception, we have been in moderate to wide margin compliance with all duly promulgated regulations.

C4.4.2 Although we have been able to weather that abuse without physical harm to other



Mr. Roland G. Fletcher
20 August 2001
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persons or property, RHP acts and omissions:

have forced upon Neutron substantive financial waste, higher than justifiable employee exposures, and a gross misallocation of human and material resources from high priority matters to matters of no credible consequence to the public health and safety;

have disrupted scheduled performance under Neutron's Reorganization Plan of 1987, destroyed its ability to receive unqualified audit opinions and attract outside capital; and

have slandered its management and aroused unwarranted concerns among the body politic.

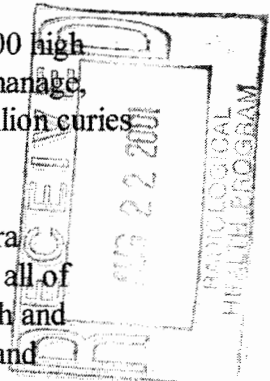
Further aggravating the abuse, MDE requires Neutron to receive individual authorizations for routine events and minor changes in its licensed operations, but then either delays interminably, or refuses to grant, the required authorizations except in the rare cases when it chooses to do so.

C4.4.3 Thus, with no demonstrated prospect of an offsetting benefit to the public health and safety, MDE has worked a hardship on numerous third parties, and severely compromised Neutron's ability to maximize its contributions to the common defense, the general welfare, the standard of living, and the role of competitive free enterprise in the development and commercialization of atomic energy in the public interest. As a result, we respectfully submit that, by regulating Neutron in the way that it has, MDE has flagrantly and boastfully violated both The Act and an increasing number of other state and federal laws; and we believe that you are well advised to address our concerns in that regard.

C4.4.4 Fundamentally, you have established for Neutron a licensee's permanent nightmare. In MDE Concern #4, you allege that Neutron does not appear to have the human and financial resources required to satisfy the "Maryland regulations, License conditions and Court Orders" which have been imposed upon it, and perhaps that is true. However, we respectfully submit that our inability to satisfy your demands flows not from the deficiencies you allege but from a combination of factors not of our making which comprise:

your refusal to be satisfied by Neutron's ability to safely perform more than 3,500 high activity shipments without adverse incident, and to receive, process, fabricate, manage, ship and even recycle thousands of high activity sources containing about 50 million curies of cobalt-60 in toto, without injurious or property damage causing incident;

your unfettered willingness and ability to adopt and enforce regulations and Extra Regulatory License Conditions, some of which are clearly impractical to satisfy, all of which are far more stringent than reasonably required to protect the public health and safety and/or reasonably assure compliance with duly promulgated regulations; and



NEUTRON PRODUCTS inc

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the reluctance of the lower Courts to believe that they have both the authority and the knowledge to "second guess" the State's official experts on the issue of impractical extra-regulatory stringency that has divided us with increasing hostility for more than a decade.

Regardless of our inability or unwillingness to perform the impractical, we submit that thirty four years of no-harm-done performance have amply demonstrated that Neutron has indeed developed and maintained the human and material resources reasonably required to enable it to engage in the creative, safe and efficacious use of atomic energy in the public interest for more than three decades.

C4.5 Proposed Course of Action

C4.5.1 We believe that our differences, though major, can be readily reconciled by a little more work on the part of MDE. What we strongly recommend is that you perform the analyses required by Executive Order 01.01.1996.03 on each of the contested ERLCs, and submit your written findings to Neutron and to the Department of Business and Economic Development ("DBED"), after which we propose that MDE and Neutron meet with DBED to discuss whatever differences we may have in our respective conclusions. If necessary, we could also bring in mutually agreeable representatives from NRC headquarters. The objective would be to arrive at a set of mutually agreeable License Conditions which would provide for ample protection of the public health and safety without unduly interfering with the ability of Neutron's management and employees to use their skills and creativity to further develop and commercialize the use of by-product materials in the public interest and fund the timely decommissioning of the facilities operated under its 01 license.

C4.5.2 Neither you nor we have a more legitimate objective; and more than seven years ago, as part of the January 3, 1994 Settlement package, we both pledged our cooperation in the public interest to Judge Pincus. Although MDE/OAG declared victory and salted our wounds, we have delivered on our part of that pledge as best we could in the circumstances. We respectfully submit that the time is more than ripe for you to join us in that endeavor before more damage is done.

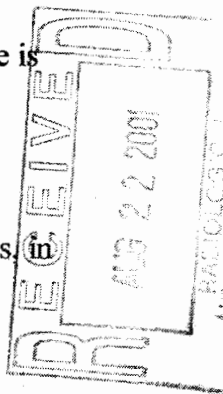
Concern #5 states:

"NPI has not implemented a Quality Assurance Program, for manufacturing of sealed sources in accordance with USNRC Reg. Guide 6.9."

Response and Corrective Action

C5.1 We will soon submit the evaluation required by MDE/NRC regarding the status of our Sealed Source and Device registrations vis-a-vis the guidance provided in NUREG 1556 (Vol.3),

NEUTRON PRODUCTS inc



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20 August 2001
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after which we will revise our Quality System to comply with the requirements of USNRC Reg. Guide 6.9.

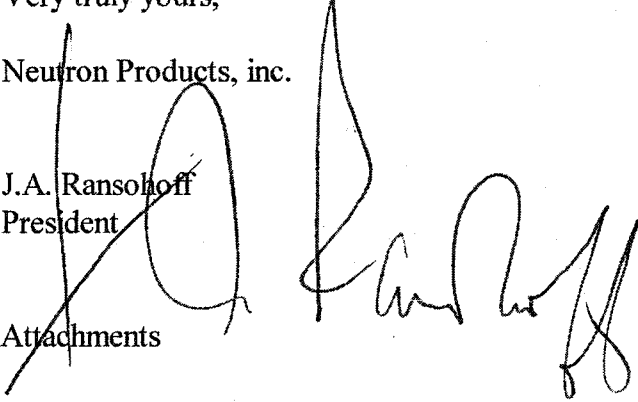
I trust that you will find this reply to be totally responsive to your letter. If, however, you require additional information or wish to discuss any of this, please give me a call.

Very truly yours,

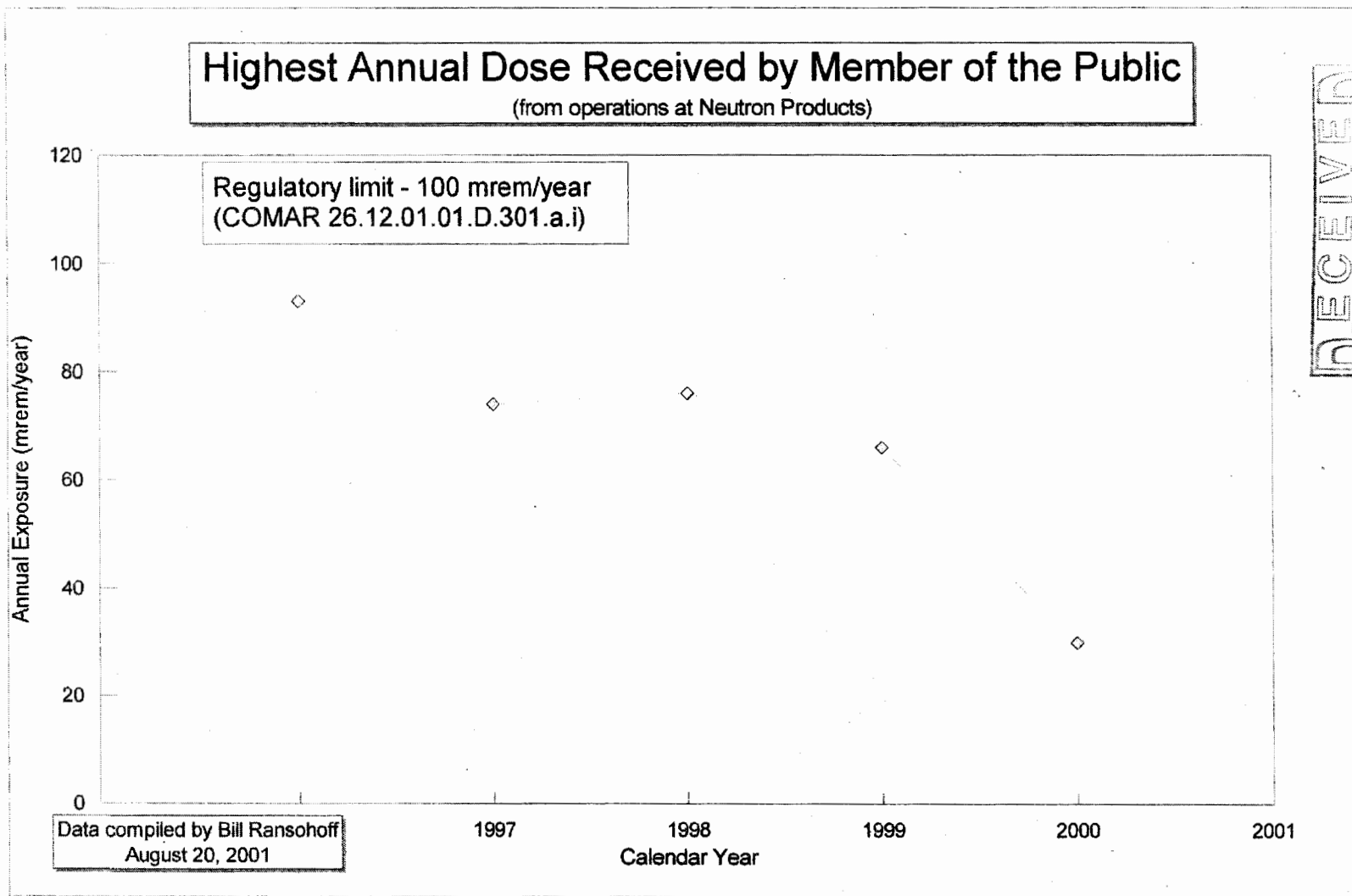
Neutron Products, inc.

J.A. Ransohoff
President

Attachments



NEUTRON PRODUCTS inc



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HEALTH PROGRAM

FIGURE 3

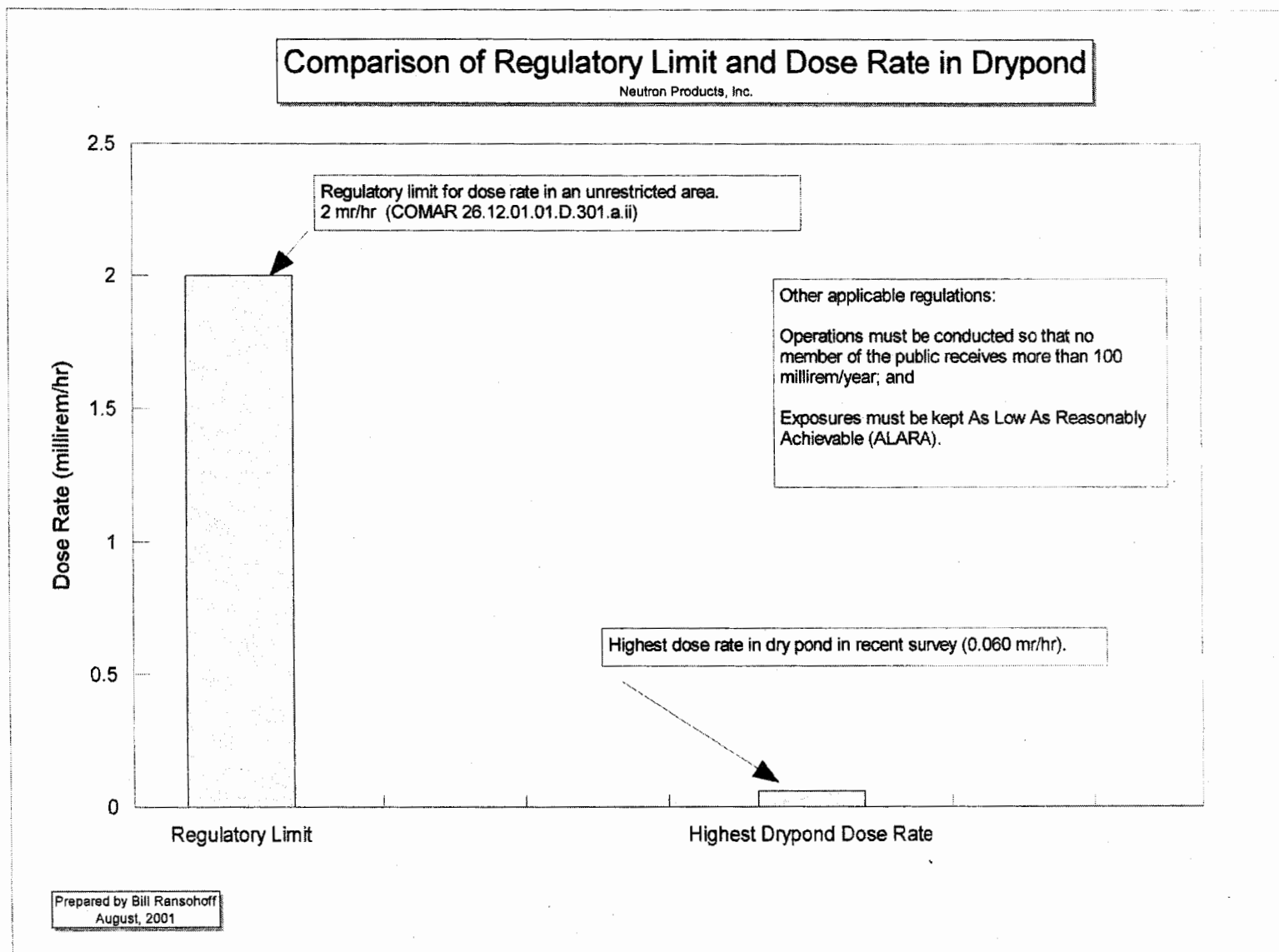
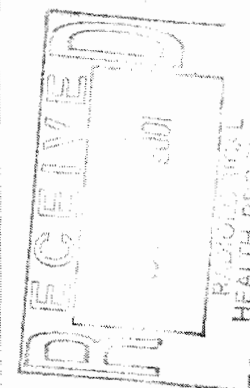
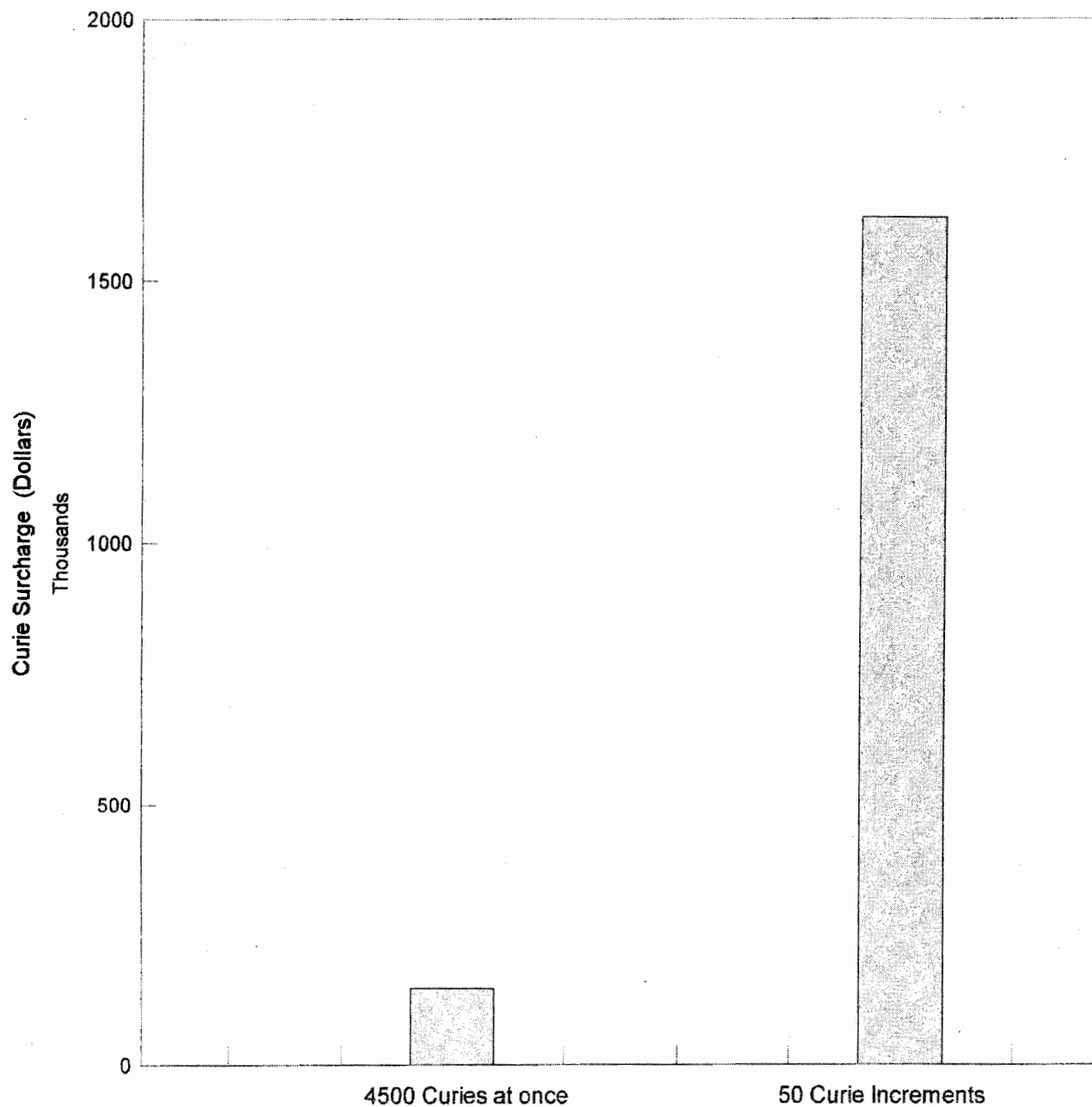


FIGURE 1



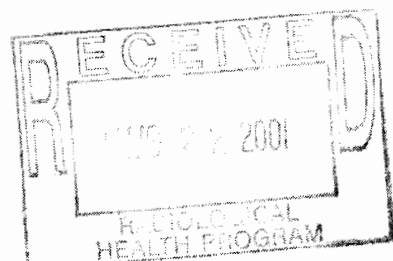
Comparison of Curie Surcharges

Piecemeal Waste Disposal vs. One Shot



Prepared by Bill Ransohoff
February 2001

FIGURE 4



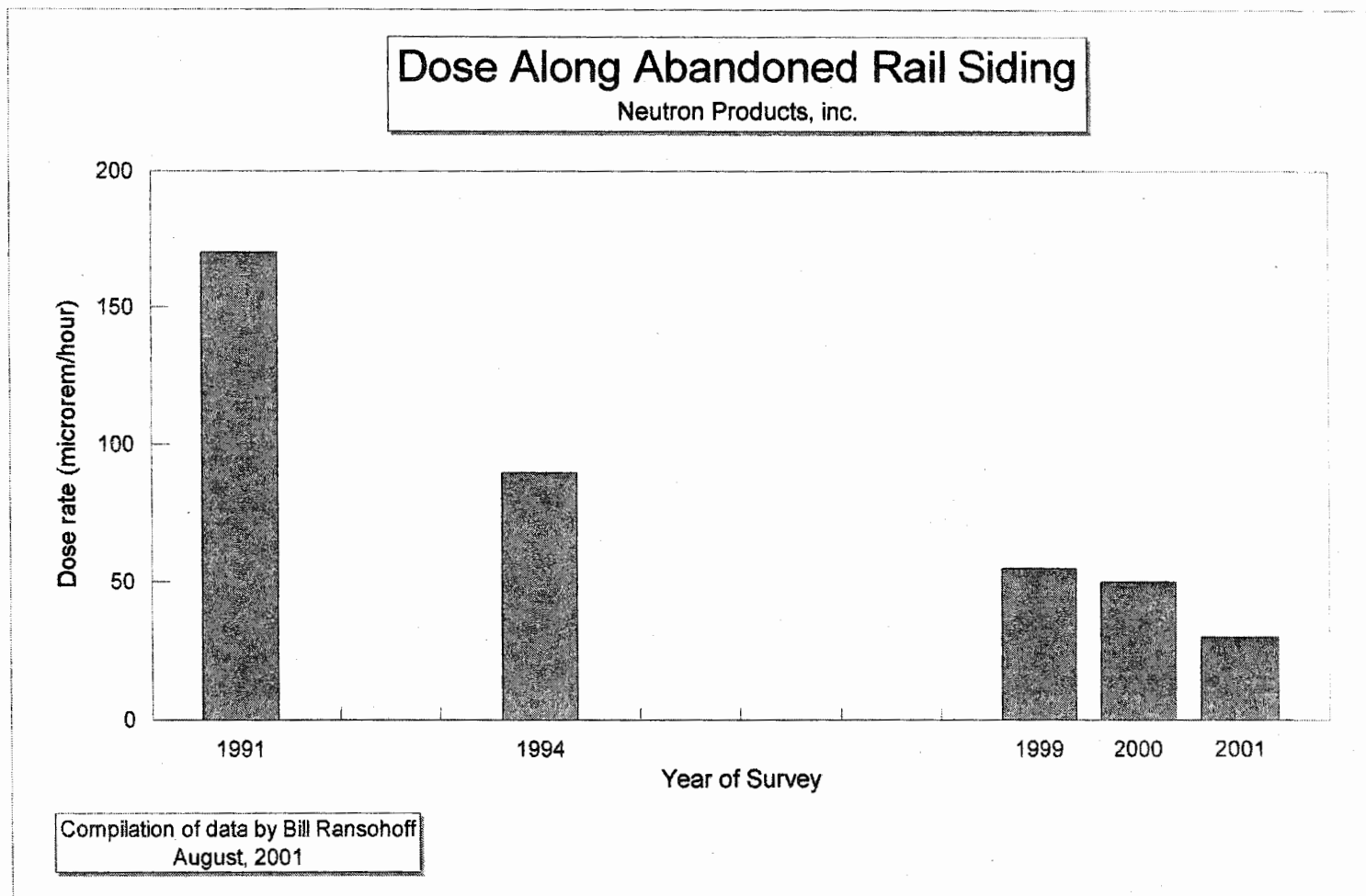


FIGURE 2

MARYLAND DEPARTMENT OF THE ENVIRONMENT
AIR AND RADIATION MANAGEMENT ADMINISTRATION
RADIOLOGICAL HEALTH PROGRAM
RADIOACTIVE MATERIALS LICENSING AND COMPLIANCE DIVISION
2500 Broening Highway
Baltimore, Maryland 21224
410-631-3300

RADIOACTIVE MATERIALS INSPECTION REPORT

Neutron Products, Inc.
22301 Mt. Ephraim Road
P.O. Box 68
Dickerson MD 20842

Radioactive Material License Number: MD-31-025-01

Phone Number: 301-349-5001

FAX Number: 301-349-5007

Alan Jacobson
Alan Jacobson, Health Physicist Supervisor

8-7-2001
Date

Carl E. Trump Jr.
Carl Trump, Jr., Program Manager

8/9/2001
Date

Raymanley
Ray Manley, Health Physicist Supervisor

8-7-2001
Date

Leon Rachuba
Leon Rachuba, Lead Health Physicist

8-8-2001
Date

Bob Nelson
Bob Nelson, Lead Health Physicist

8/9/01
Date

**MARYLAND DEPARTMENT OF THE ENVIRONMENT
AIR & RADIATION MANAGEMENT ADMINISTRATION**

Radiological Health Program

MEMORANDUM

TO: Alan Jacobson, Health Physicist Supervisor Radioactive Material Inspection & Compliance Section

FROM: Ray Manley, Health Physicist Supervisor Radioactive Materials Licensing Section, Radiological Health Program (RHP)

DATE: June 14, 2001

SUBJECT: **INSPECTOR SUMMARY FOR June 13, 2001 NEUTRON PRODUCTS, INC. INSPECTION**

The following subject matter was reviewed at NPI pursuant to licensee activities conducted in the Limited Access (LAA) and surrounding areas.

1. Compactor
2. Radioactive material waste management
3. Previous inspection violations and concerns
4. Status of operational systems in the LAA
5. LAA surveys (documentation by RKN)

COMPACTOR

Compacting at NPI is being conducted by authorization of NPI procedures as permitted by amendment 44 of the 01 license. NPI started use of the new compactor on 10/21/2000. The licensee is using the compactor in the assistance of meeting current Circuit Court shipping deadline requirements and 01-license condition 21 shipping deadlines. The licensee stated that they intend to meet the Court Order June 30, 2001 deadline. The shipping deadlines are reviewed in the subsequent item in this report. To the date of this inspection, the licensee has compacted 12 drums at a compaction rate between 5-1 and 7-1. Discussions with the RSO indicate unsuccessful attempts by the licensee to increase the compaction rate higher than 7-1 however, these attempts resulted in bulging drums and failure of the inner retention devices (**concern**). The licensee admits that eight out of the first 12 drums NPI compacted sustained some level of damage (imperfections) pursuant to this attempt to overstuff the drums. The licensee has desisted in this overstuffing technique. The

RSO stated that he anticipated an approximate total of 19 compacted 55 gallon drums with approximately 229 millicuries of C0-60 to be included in the prior to June 30th shipment. Current NPI individuals trained for and conducting compacting activities are Jeffrey Williams, Richard Demory, Bill Ransohoff and Brad Young. As per the procedures, all operators are using full-face respirators. High volume air sampling conducted during compactor operations indicates low airborne concentrations (average concentrations in 10^{-10} uCi/cc range). No lapel samplers are being used during operations to evaluate breathing zone (**concern**). Licensee states their evaluation by counting respirator filters is unreliable because of transfer of hand contamination to the filter. Initial meter surveys are conducted prior to and during operations. Eight contamination smears taken in areas around the compactor by the licensee following operations have indicated levels of contamination below operational procedure limits. There was one contamination incident pursuant to pre-compacted waste. On June 4, 2000, compactor operators sorted through uncompacted boxes of waste to remove disposed of aerosol cans. This activity was conducted without the knowledge of the RSO who was not at the site at the time. The operation created significant level of personnel contamination (**concern**). Dose-rates of compacted drums average 130 mR/hr at a meter with a maximum contact dose-rate of 1200 mR/hr. All operators use extremity dosimetry. The RSO stated that the compactor has had no malfunction problems of any kind since the inception of its use. The RSO stated that when waste of multiple generation dates is compacted the drum is labeled with the date of the oldest waste. However, this inspector was not able to visually inspect any compacted drum for labeling or potential damage because the licensee has stored the compacted drums in the rear of the South waste room with approximately a dozen empty drums in front of them and with a dose-rate at the waste room door of approximately 1 R/hr (**concern**).

RADIOACTIVE MATERIAL WASTE MANAGEMENT

Summary of NPI shipping requirements:

NPI must ship by Court Order, 600 cubic feet of low activity waste by June 30, 2001. By June 30, 2002, NPI must ship at least 80 % of the remaining low activity waste activity waste stored at the facility. NPI must by 01 license condition 21 ship out all RAM waste (stored outside the pool) generated after August 1999 within two years of its generation date (first deadline August 2001). For waste generated after August 1999 (stored in the pool) the licensee must ship this waste within three years of its generation (first deadline August 2002). All the radioactive material waste generated by the licensee prior to August 1999 must be removed from the facility by August 2004.

Summary of proposed prior to June 30, 2001 waste shipment

The RSO indicated that the waste shipment would include 19 drums of compacted waste in 55-gallon drums with activity of 229 mCi and boxes containing uncompacted waste. The total estimate of shipped activity is 500 mCi. The RSO indicated that the waste shipped would include some of the prior to August 1999 waste and waste generated after August 1999. The waste is to be loaded into a NPI lead shielded exclusive use truck container and shipped as LAA to ATG for reduction by incineration (50-1 to 100-1) and subsequently shipped for burial to Envirocare. This container will be locked and stored in the unrestricted parking lot during loading and prior to NPI transport (**concern**).

PREVIOUS INSPECTION VIOLATIONS AND CONCERNS

An interview was held with Mat Repp in the LAA. Mr. Repp indicated that he was now familiar with the roughing filter change procedure. He showed a number of documents in the hot cell log indicating proper documentation of a roughing filter change in accordance with the procedures. He showed that a copy of the procedure is now located in the LAA.

STATUS OF OPERATIONAL SYSTEMS IN THE LAA

Mr. Williams as RSO indicated that he is getting into the LAA only 4 times a month (**concern**). An interview with Jeff Corun (hot cell operator) indicated that the current activity in the hot cell was the recycling of radiation processing sources prior to transfer into the D-1 irradiator. He indicated he can process approximately 14 of these sources in two days. He also indicated that the recycle process and transfer had recently been completed for the D-II irradiator.

The licensee has a daily LAA checklist that includes check of the LAA for stray animals in the area. NPI has had previous problems with potential animal vectors through dogs and birds. The LAA inspection team observed a female cat and litter located in the rear of the LAA courtyard area adjacent to the North wall of the welding shop (**concern**). Adjacent to the cats was evidence (food containers) that NPI personnel from the welding shop had been feeding the animals. Inspection of the welding shop indicated two uncontrolled entrances into the LAA from the shop via large windows that crank open. This appears to show a lack of control by NPI management regarding access into the LAA. (**concern**). The welding shop is a restricted area, however, surveys at the window indicated a dose rate of 7 mR/hr. There was no "CRA" sign posted in the area (**concern**).

When exiting the LAA it was determined that the initial contamination frisker was not operational (**concern**). The RSO indicated that the initial frisking activities had been moved to the frisker outside of the HECM because of temporary activities in the LAA raising the background in the frisker area and he was unaware of the fact the unit was nonoperational. Use of the HECM area frisker appears to potentially allow transport of significant contamination past the shower area (**concern**). The RSO subsequently determined that the initial frisking station could be made operational by replacing the detector.

LAA parameters 2001

pH 5-6

conductivity 1-5 u/Siemens-cc

pool activity max 8×10^{-4} uCi/cc avg. 6×10^{-5} uCi/cc

large volume air sampling maximum 1.7×10^{-7} uCi/cc

monthly dumpster surveys—background

minipump airborne (hot cell) 1.1×10^{-13} uCi/cc

since 9/2000 all meters calibrated on quarterly frequency

inventory and leak test of sealed sources last conducted 3/28/2001 all $< .005$ uCi

contamination smears maximum noted in March 2001 to rear of hot cell door 606,000

INTRODUCTION

On June 13 and 28, 2001, Messrs. Alan Jacobson, Ray Manley, Bob Nelson, Carl Trump, Jr., and Leon Rachuba of the Maryland Department of the Environment's (MDE) Radiological Health Program (RHP) conducted a routine unannounced radioactive materials inspection at the Neutron Products Incorporated (NPI) Dickerson facility. The purpose of the inspection was to examine the licensee's use and control of licensed radioactive material relative to Maryland Radiation Protection Regulations and specific license conditions. The inspection examined radiation safety, compliance with conditions of the license, adherence to procedures and proper maintenance of records, interviews with personnel, general observations, and independent measurements. As a result of the inspection 15 violations and 5 concerns were identified. These findings were discussed with Messrs. Jackson Ransohoff, Jeffrey Williams, Marvin Turkanis and Bill Ransohoff at the licensee management exit interview held on June 28, 2001 at the conclusion of the inspection. A Departmental Letter-Notice of Violation dated July 26, 2001 was sent to the licensee.

PROGRAM

The licensee manufactures and distributes cobalt-60 sealed sources for teletherapy and radiation processing. Currently, NPI possess 806,900 curies of cobalt-60 under this license. In addition, their radioactive waste inventories were 3635 curies in the main pool, 128 curies in the north canal and 206 curies in dry storage. Four to eight employees work in the Limited Access Area (LAA) on a regular basis. NPI employs approximately 60 persons. A November 3, 2000 Montgomery County Circuit Court Order required NPI to cease and desist from conducting all activities under this license. However, a December 21, 2000, Court Order permits NPI to resume licensed activities under specified conditions.

SPECIFIC AREAS OF REVIEW:

The following areas were inspected and reviewed: Dosimetry, Occupational Exposures, Random Inspections, Quarterly Audits, Radiation Safety Committee Minutes, Respiratory Protection Program, Inventory, General Operations in the Limited Access Area (LAA), Implementation of Radiation Safety Program, Boundary Monitoring, One Kilometer Surveys, Shipping and Receiving Records, Floor Monitoring, Health Physics Monthly Reports, Disposal of Radioactive Waste, Training, Air Monitoring, Survey Meter Calibration, Water Monitoring, Sealed Source and Device Sheets, Whole Body Counting Records, Exposure to Members of the General Public, Posting of Required Documents, Waste Compaction, Soil Contamination and Waste Storage.

INTERVIEWS

Interviews were conducted with the following NPI employees:

Jackson Ransohoff	President
Marvin Turkanis	Vice President
Jeffrey Williams	Radiation Safety Officer
Kathy Bupp	Health Physics Technician
Jeff Corun	Hot Cell Manager
Bill Ransohoff	Project Engineer
Matt Repp	LAA Technician

CONCERNS

1. NPI possesses five (5) teletherapy heads with "stuck" cobalt-60 sealed sources (in the shielded position) located in the courtyard area of the Limited Access Area (LAA). According to the Radiation Safety Officer (RSO) some of these sources have been in storage for over 10 years. Radioactive material once determined to be useless and of no demonstrated economic value, is considered waste and should be treated accordingly. Furthermore, NPI currently stores in the main pool stellite corners containing approximately 25,000 curies of cobalt-60. Since this material does not have any apparent economic value, it should be declared as radioactive waste and shipped for disposal within four (4) years in accordance with license criteria. This is an unresolved concern identified during September 2000 inspection.
2. Inspectors identified poor radioactive waste storage practices and conditions such as rusted drums, drums lacking retaining rings, open waste containers, waste stored in plastic bags instead of drums, inadequate containment of contamination and eight (8) damaged drums caused by over compaction. Furthermore, NPI is storing radioactive waste containers in the courtyard area of the LAA, unprotected from the wind, rain, snow, ice, sun and extreme temperatures.
3. On June 13, 2001, NPI personnel issued MDE Inspectors written visitor safety instructions that were missing pages 2, 4 and 6 of 7 pages.
4. It appears that NPI does not have the sufficient trained personnel, financial resources and commitment of management necessary to establish compliance with Maryland Regulations, License Conditions and Court Orders.
5. NPI has not implemented a Quality Assurance Program, for manufacturing of sealed sources, in accordance with USNRC Reg. Guide 6.9.

VIOLATIONS

1. Section C.31 titled, "Specific Terms and Conditions of License" and License Condition 22.B(2) which requires, in part, that all soils, wherever found contaminated by NPI licensed activities and exhibiting levels of cobalt-60 contamination exceeding 8 picocuries per gram above background must be removed by NPI and properly stored/disposed of as radioactive waste.

Contrary to Section C.31 and License Condition 22.B(2), NPI failed to remove cobalt-60 contaminated soil exceeding the above-specified limit. Specifically, on September 20, 2000 RHP inspectors collected soil samples at sites located both on and off of the NPI facility. Maryland Radiation Laboratory sampling results from these samples indicated that of the 10 samples taken, all indicated soil having cobalt-60 concentrations exceeding 8 picocuries per gram. The range was from 28 – 610 picocurie per gram of soil. NPI failed to remove the contaminated soils from the areas exceeding the license limit. This is a **REPEAT** violation from the Departmental inspection of November 1999 and September 2000. Furthermore, NPI has still not removed the soil contaminated with cobalt-60 from the adjacent railroad property to establish compliance with the 8.0 picocurie per gram concentration limit. Monthly soil samples collected and analyzed by NPI personnel in February, March, April and May 2001 indicate that soil concentrations continue to exceed the license limit. The Stipulation and Settlement (Civil Case No. 76639 in the Circuit Court of Montgomery County) dated January 3, 1994 required NPI to clean these contaminated areas by June 15, 1994. NPI has missed this deadline and has refused to remediate this property. NPI estimates that there is 840 cu. ft. of contaminated soil in the dry pond, 300 cu. ft. down stream within the fence, 70 cu. ft. in

the stone trap and 600 cu. ft. down stream off site. Inspectors observed dry pond soil remediation in progress during the inspection. No contaminated soil has been removed from the railroad property since the September 2000 inspection. On 4/24/2001, NPI collected 16 soil samples from the dry pond and areas down stream. Results ranged from 2.1 to 399 picocuries per gram. 6 samples were below the 8.0 picocurie per gram license limit and 10 were above.

2. Section D.101 titled, "Radiation Protection Programs" states that in addition to complying with all other provisions of these regulations, a licensee shall use all means to maintain radiation exposures and releases of radioactive material as low as reasonably achievable (ALARA).

Contrary to Section D.101, the licensee failed to use all means necessary to maintain release of radioactive material as low as reasonably achievable. Specifically, NPI has failed to use means necessary such as the adequate containment of radioactive materials, proper waste storage practices and regular shipments of radioactive waste, to a licensed repository. On June 13, 2001, Inspectors collected 21 wipe samples in the LAA. Results ranged from 4 dpm to 129,980 dpm. Nine wipe samples were over 2000 dpm. This contaminated area lacks adequate containment when the doors are open to the courtyard and radioactive materials are potentially released. One only has to review the soil sample results referred to in violation #1 to determine that NPI is not maintaining control over their radioactive material and it is continuing to be released. In spite of curtailed source-manufacturing activities, NPI continues to release cobalt-60 into the environment in an uncontrolled manner. On November 2, 2000, NPI identified 0.4 microcuries of cobalt-60 in approximately 10 gallons of soil during a residential property survey of 21821 Big Woods Road in Dickerson, Maryland. NPI has not removed any contaminated soil from the railroad spur since the September 2000 inspection. The contamination in the courtyard contributes to both waterborne and airborne effluent releases. Neither of these two courtyard release pathways are controlled or monitored by NPI to demonstrate compliance with applicable regulatory effluent release limits. Evidence of releases is identified in the dry pond, railroad spur, areas down stream and residential properties within a one kilometer radius of the plant. The facility lacks adequate containment in areas where radioactive materials are used and stored. The failure to implement appropriate controls to eliminate quantities of contamination in outdoor, unrestricted areas is a significant programmatic weakness.

3. Section C.31 titled, "Specific Terms and Conditions of License" and License Condition 21.B requires that within 90 days of the issuance of the license, NPI must submit to the Department for approval a comprehensive plan for disposal of all low level radioactive wastes in accordance with those specifications defined in this condition.

Contrary to Section C.31 and License Condition 21.B, NPI's low level radioactive waste plan was submitted to MDE on December 10, 1999 however, upon review it was found to be inadequate and as of this date a comprehensive plan has not been submitted. Deficiencies in the plan were discussed in a Departmental letter dated March 20, 2000, but NPI has not adequately responded to it. On October 27, 2000 the RHP received NPI's Decommissioning Plan dated October 20, 2000 which included a planned schedule for radioactive waste shipments. The RHP has reviewed this plan and determined that it is inadequate because it does not demonstrate compliance with the current radioactive material license waste disposal criteria. Table 2.1 of this plan describes a 12 year shipment schedule for only a small fraction of the total activity of current radioactive

NPI waste storage practices in the LAA

This inspector identified a number of concerns with waste storage practices in the LAA. There is a significant amount of radioactive material waste and/or sources being stored in the courtyard and not in the two radioactive material waste rooms (**concern**). Outside of the storage rooms is the following storage:

18 B-25 boxes of radioactive material soil (approximately 96 cubic feet apiece)

54 55-gallon drums of radioactive material soil (approximately 7.5 cubic feet apiece)

2 locked truck trailers (Sealand type) containing a portion of the above drums.

Large locked blue trailer (Sealand type) containing 46 boxes of uncompacted waste. (for prior to June 30, 2001 shipment and six C0-60 sources jammed in teletherapy heads.

55-gallon waste container of uncompacted waste removed from south waste storage room to allow for storage of empty compactor drums (labeled as Yellow-II).

B-25s All soil in the B-25s was not secured (**concern**). B-25s filled post to August 1999 are tag labeled with isotope, date of removal and estimate of activity (all .2 mCi) and a "CRAM". B-25s filled prior to August 1999 were stenciled on the side indicating radioactive soil. One of the B-25 lids was slid open approximately 5-inches (reason unknown by RSO) (**concern**). This would appear to allow water access into the unit during a rainstorm. Other evidence of this was noted in another B-25 that had approximately 3-inches of water on top of the soil in the container (**concern**).

55-gallon drums. No retaining rings were noted on any drums containing soil (**concern**). There was a significant level of rust on the drums some to the point of the entire drum being brown instead of the usual black color (**concern**). Many drums were not labeled as to any aspect of their contents (**concern**).

Large blue Sealand type. Dose rate at contact was 90 mR/hr. Dose rate at 30 cm was 50 mR/hr. The only labeling was almost nonlegible (rusted) CRA sign on front of the unit. No radiation signage coloration was visible and the radiation symbol was totally illegible (**concern**).

Approximately 4 yellow plastic bags containing LLW were noted stuffed in the rear of the North Waste room. NPI had previously indicated that all bagged waste of this type would be drummed due to a history of deterioration of the plastic. The RSO stated that all other bags had been drummed, however during the waste room cleanout they had discovered more. No explanation was given as to why the bags were not subsequently drummed (**concern**).

waste inventory. The plan did not describe the shipment schedule and protocol for the disposal of the contaminated soil in storage. All radioactive waste that was generated prior to August 1999 is required to be shipped for disposal by August 2004. This is a **REPEAT** violation from the Departmental inspection of November 1999 and September 2000.

4. Section C.29(c)(2) titled, "Financial Assurance and Recordkeeping for Decommissioning" requires, in part, that each licensee who is a holder of a specific license issued before October 15, 1998 and of a type described in paragraph (a) of C.29 must submit, on or before October 15, 1998 a decommissioning funding plan or a certification of financial assurance for decommissioning in an amount of at least equal to \$750,000. Also, the requirements of Section C.29(g)(2) requires that no person shall receive, possess, use, transfer, own, or acquire radioactive material of a type described in paragraphs (a) and (b) of C.29 for more than 180 days following the dates prescribed in the section for submittal of a decommissioning funding plan or certification, if the decommissioning funding plan or certification has not been approved by the Agency.

Contrary to Section C.29(c)(2), NPI has not met the \$750,000 certification by the specified dates of this regulation. Furthermore, NPI's decommissioning funding plan has not been approved by the Agency. Pursuant to NPI's failure to provide an adequate decommissioning funding plan or the \$750,000 certification by April 13, 1999 (180 days post October 15, 1998) NPI has continued to receive, possess, use, transfer, own, or acquire radioactive material of a type described in paragraphs (a) after the 180 day (April 13, 1999) deadline. This is a **REPEAT** violation from the Departmental inspection of November 1999 and the February 2000.

5. Section J.11(a)(4) titled, "Posting of Notices to Workers" requires, in part, that the licensee post any notice of violation involving radiological working conditions and any response from the licensee.

Contrary to Section J.11(a)(4), NPI failed to post their February 12, 2001 compliance response to the January 19, 2001 Departmental letter-Notice of Violation which described numerous violations found during the September 18-20, 2000 radioactive materials inspection. According to Bill Ransohoff and Jeff Williams, NPI maintains 4 posting locations to comply with Section J.11, the Accounting Office, Jeff William's Office, Jack Ransohoff's Office and the Administrative Office on the first floor near the visitor log. All four of these locations were inspected on June 13, 2001.

6. Section D.101 titled, "Radiation Protection Programs" requires in part, that each licensee review the radiation protection program content and implementation at intervals not to exceed 12 months.

Contrary to Section D.101, NPI failed to conduct the annual review of the radiation protection program content and implementation for the calendar year 2000. Specifically, NPI has not conducted a review of the radiation protection program, content and implementation within the last 12 months. The previous review was conducted on 6/2/01. The RSO stated that the review for the year of 2000 was still in the draft form, however, it was not available for inspection upon request on 6/13 and 6/28/01.

7. Section D.302(b)(ii)(1) titled, "Compliance with Dose Limits for Individual Members of the Public" requires the licensee to show compliance with the annual dose limit for individual members of the public.

Contrary to Section D.302(b)(ii)(1), NPI failed to demonstrate by measurement, or calculation, or appropriate simulation model that the total effective dose equivalent to the individual likely to receive the highest dose from the licensed source of radiation does not exceed the annual dose limit as described in Section D. 301 for the calendar year of 2000.

Mr. Carroll Fisk has been the "individual most likely to receive the highest dose" for the years of 1996, 1997, 1998 and 1999. He died during the year of 2000. NPI estimated that Mr. Fisk received 66 millirem during the year of 1999 from NPI. A TLD that was placed inside his home and exchanged at a quarterly frequency measured 66 millirem for the year. A TLD placed at his portico measured 105 millirem for the year of 1999. For the year of 2000, the inside TLD measured 43 millirem and the portico TLD measured 88.6 millirem. Currently, there are new tenants living in the Fisk house. The TLD inside the Lamson house measured 21.4 millirem and 45 millirem outside. Background has been subtracted from the Fisk and Lamson results. Background is measured by a TLD, exchanged quarterly at the Lytle Barn. Background for the year 2000 was determined to be 65.2 millirem. It appears that NPI will be able to demonstrate compliance with the 100 millirem per year limit. However, during the inspection, they could not exactly identify the specific individual likely to receive the highest dose from NPI.

8. Section D.902 titled, "Posting Requirements" which requires the licensee to post each radiation area with a conspicuous sign or signs bearing the radiation symbol and the words "CAUTION, RADIATION AREA" (CRA). Section D.901 requires the radiation symbol to use the colors magenta, purple or black on a yellow background.

- a. Contrary to Section D.902, NPI failed to post the required "CAUTION, RADIATION AREA" sign in the radiation area located near the windows of the welding shop.
- b. Contrary to Sections D.901 and D.902, NPI failed to properly post the radiation area located near the blue Sealand type container in the courtyard area of the LAA. The CRA sign was not conspicuous because it was rusted out and almost illegible. The sign did not have a yellow background and the radiation symbol was not visible at all.

9. Section D.904(a) titled, "Labeling Containers and Radiation Machines" requires in part, the licensee to ensure that each container of licensed radioactive material bears a clearly visible label bearing the radiation symbol and the words "CAUTION, Radioactive Material" or "Danger, Radioactive Material".

NPI failed to properly label drums of soil containing cobalt-60 located in the courtyard area of the Limited Access Area with a clearly visible label bearing the radiation symbol and the words "CAUTION, Radioactive Material" or DANGER, Radioactive Material". Inspectors observed drums with no labels at all. Furthermore, the drums were stored outside, unprotected from the sun, wind, rain, snow, ice and extreme temperatures.

10. Section D.501 titled, "Surveys and Monitoring-General" requires a licensee to make or cause to be made, surveys that are necessary under the circumstances to evaluate radiation levels, concentrations or quantities of radioactive material and the potential radiological

hazards that could be present. License condition 22.C. requires NPI to conduct floor monitoring surveys on all surfaces within the facility outside of the LAA.

Contrary to the requirements of Section D.501 and License condition 22.C, NPI failed to conduct floor monitoring surveys of the welding shop during the calendar year of 2000 and the first five months of 2001. Furthermore, no floor monitoring survey records of the welding shop were available for inspection.

11. Section D.1101 titled "Records-General Provisions" requires the licensee to use units of becquerel, grey, sievert, coulomb per kilogram, disintegrations per minute, rad, rem and roentgen and clearly indicate the units of all quantities on records required by Part D.

Contrary to the requirements of Section D.1101, the results soil sample surveys dated 2/1/01, 2/21/01, 3/09/01, 4/25/01 and 5/16/01 were maintained in units of gross counts instead of picocuries. Furthermore, the efficiency of the counting system was not documented on the survey records. As a result, the records did not identify the samples which exceeded the 8.0 picocurie per gram limit.

12. Section C.31 titled "Specific Terms and Condition of License" and License Condition 17.A. require in part, a Health Physics Technician to ensure the proper use of the portal monitor, hand held frisker and any other devices employed to detect levels of radioactivity present on person or items which exit the LAA. License Condition 37 and Procedure R 2029 dated June 14, 1989 titled "Procedure For Exit From The Limited Access Area" requires in part, for one to frisk themselves or have a Health Physics Technician frisk them at the pancake probe frisking station located at the entrance to the clean shower room. Procedure R 2028 dated February 7, 1991 requires in part, for one to verify that the rate meter and the pancake probe in the clean room is operational prior to entering the LAA.

Contrary to the requirements of Sections C.31 and License Condition 17.A., the technician failed to ensure the proper use of the hand held frisker. The RSO failed to verify that the rate meter and the pancake probe located at the frisking station at the entrance to the clean shower room, were operational prior to entering the LAA. Upon exiting the LAA on 6/13/2001, MDE Inspectors identified that the hand held frisker was not operational and it failed to respond to a radiation check source. Upon further review, it was determined that the detector was broken. Although a back up system was available, the RSO bypassed the clean shower room frisking station instead of replacing the defective detector. Then he walked through the clean shower room and used the frisking station located at the Helguson monitor.

13. Section C.31 titled, "Specific Terms and Conditions of License", License Condition 37 and Procedure 2028 titled "Procedure For Entrance To The Limited Access Area" prohibits eating drinking and smoking in all parts of the LAA. The June 23, 1988 Departmental Order states that the licensee shall immediately stop all eating, drinking and smoking in the offices and work areas of the LAA.

Contrary to Section C.31 and License Condition 27, on June 13, 2001, RHP Inspectors found evidence that NPI employees were feeding a cat and a litter of kittens in the courtyard area of the LAA. Specifically, the inspectors observed a plate with chocolate cake that was passed through a window from the welding shop into the LAA. The RHP Inspectors instructed the RSO to remove the feline family from the LAA however, on June 28, 2001 the cat and her litter were still living in this area where radioactive materials are stored.

Furthermore, on June 13, 2001 Inspectors found empty soda cans, coffee cups and food wastes in a waste can located in the Helguson monitor counting room. On June 28, 2001 Inspectors found evidence of food and drink in this same room which is adjacent to and with direct access to the LAA pool area. Specifically, a cracker wrapper was found on the floor and circular stained rings were found on the top of a cabinet. Furthermore, disposable coffee cups, cracker wrappers and paper towels soaked in coffee were found in this waste can.

14. Section C.31 and License Condition 21.B.5. require NPI to provide the RHP and MDE's Hazardous and Solid Waste Management Administration copies of radioactive waste shipment records within 14 days of shipment dates.

NPI failed to provide the RHP and MDE's Hazardous and Solid Waste Management Administration copies of the June 23, 2001 radioactive waste shipment records within 14 days of shipment.

MISCELLANEOUS NOTES

- On 6/23/2001, NPI shipped approximately 520 millicuries, 595.5 cubic feet, 7675 lbs. of radioactive waste to Allied Technology Group, Inc. in Richland, Washington.
- 1999 collective whole body occupational exposure was 14.9 person-rem
- 1998 collective whole body occupational exposure was 32.3 person-rem
- For 1999, 2 employees exceeded 2 rem
- Results of interviews indicated that the RSO enters the LAA approximately 2-6 times per month.
- Inspectors conducted a dose rate survey using an Eberline PIC 6, SN 2237, calibrated 8/31/2000 by RSO Inc.

Measured:

500 mR/hr	at contact with a drum in the South Waste Room
1050 mR/hr	at contact with a second drum in the South Waste Room
1000 mR/hr	at contact with a drum in the North Waste Room
2000 mR/hr	at contact with a second drum in the North Waste Room

- Inspectors conducted a dose rate survey with an Eberline E-520, SN 389 calibrated 5/27/2001 by RSO Inc.
Measured:

2.0 mR/hr	at contact with hot cell window
15.0 mR/hr	at contact with shipping cask containing a returned teletherapy source
50.0 mR/hr	at contact with the North Waste Room door closed
100.0 mR/hr	at the space between the two North Waste Room doors
70.0 mR/hr	at contact with the South Waste Room door
100 mR/hr	at 1 ft. from blue Sealand Waste Storage container
40.0 mR/hr	at 1 meter from North Canal resin bottle
- Dick Demory conducted the annual cleaning of the pools and canals during the week of 12/26/2000.
- The Washington Suburban Sanitary Commission has determined that mop water is industrial discharge and, as a result, may not be discharged into the sanitary sewerage. NPI has since reduced the frequency of mopping the floor of the LAA. Furthermore, when they are mopping, they are using less water. The mop water is stored in drums. The dose rate at contact with the drums is reported to be 200 mR/hr. As the water in the

uncovered drum evaporates, the cobalt-60 concentration becomes higher. As the volume of the water in the drum becomes lower, due to evaporation, NPI personnel add more mop water to the drum. NPI has no plans to dispose of this contaminated water.

- Cathy Bupp and Dave Baker conduct monthly surveys of floors in unrestricted areas using an Eberline 600. No contamination has been found during the year of 2000 and year to date 2001.

- Dose rates behind the hot cell range from 25 to over 200 mR/hr.

- One Kilometer Survey Results

22175 Dickerson School Road	04/26/2001	No Contamination Found
20120 Mouth of Monocacy Road	03/30/2001	No Contamination Found
22341 Mt. Ephraim Road	02/26/2001	No Contamination Found
21375 Martinsburg Road	01/29/2001	No Contamination Found
19700 Barnesville Road	12/26/2000	No Contamination Found
21821 Big Woods Road	11/02/2000	0.4 uCi Co-60 in 10 gal. soil
Rachel Property	10/27/2000	No Contamination Found
21700 Big Woods Road	09/29/2000	No Contamination Found

- On 10/11/2000, Helguson Scientific Services Inc. (925-846-3453) conducted whole body Counting on 16 of NPI's LAA employees at the Barnesville Fire Department. 4 employees tested positive for Cobalt-60. Results ranged from 3 -10 (+ or - 1) nanocuries.

- NPI received 187,526 curies cobalt-60 from Empressa, Argentina on 2/22/01.

- Sealed source shipment records were inspected and reviewed and customers' licenses were spot-checked. No deficiencies were found.

- Monthly Health Physics Reports are prepared by R.E. Alexander, CHP. On page 4, section 4.2 of the May 2001 report, Mr. Alexander states that NPI now conducts one of the best contamination control programs that he has ever seen.

- Mr. Alexander conducts quarterly training for employees who work in the LAA. On March 30, 2001 provided LAA employees with a course on "Time, Distance and Shielding". During the fourth quarter of 2000, the subject was "Occupational Radiation Protection Regulatory Controls and 12 employees attended.

- Three LAA workers received 1.87, 2.00 and 2.88 Rem TEDE for the year of 2000.

- Historic Waste Disposal Records were reviewed

02/16/98	100 cu. ft.	36 millicuries
09/05/96	1280 cu. ft.	100 millicuries
12/19/90	78.3 cu. ft.	
05/21/90	62.7 cu. ft.	0.99 curies
07/21/88	65.4 cu. ft.	0.99 curies

- On June 21, 2000, Bob Nelson assisted an inspector from the Maryland Occupational Safety and Health Administration (MOSH) in conducting a safety inspection of NPI's LAA. The MOSH Inspector identified numerous violations including the construction of a temporary makeshift scaffold on top of the 20-foot high moveable crane where an 8 foot step ladder was used to change burned out light bulbs in the LAA near the main pool. Other violations and concerns included exposed belts on the drill press, no safety guards on the lathe, uncovered electrical boxes, lack of a railing around the main pool, stairs without handrails, inadequate eye protection and blocked fire exits. MOSH issued a proposed penalty of \$3825.00. On 9/22/200, an informal settlement agreement was signed and on 10/13/2000, NPI paid a \$1450.00 penalty.

ATTACHMENTS

06/28/2001 Radioactive Material Inspection Finding and Licensee Acknowledgement Form

06/23/2001 Waste Manifest-Shipping Paper

06/15/2001 Inventory

11/02/2000 Court Order, Cease and Desist, Permanent Injunction

12/21/2000 Order Modifying Permanent Injunction Pending Appeal

06/14/2001 Memorandum-LAA Inspection Summary

07/05/2001 Maryland Laboratory Administration-Report

MARYLAND STATE DEPARTMENT OF HEALTH AND MENTAL HYGIENE
RADIATION LABORATORY REPORT
(410) 767-5537

SAMPLE SOURCE: NPICOLLECTOR: R. NelsonSAMPLE TYPE: WipeCOLLECTION DATE: 06/13/01RECEIPT DATE: 06/14/01REPORT DATE: 07/05/01ANALYSES BY: S. Wise*S. Wise*

Activity (pCi/wipe)

LAB. No.

Wipe#

CO-60

3744	1	hot cell table	$< 1.74 \times 10$	- 41 DPM
3745	2	floor by table	$1.092 \times 10^2 \pm 9.881$	- 242 DPM
3746	3	mazzini's steps	$5.462 \times 10 \pm 6.668$	- 12 DPM
3747	4	step off area	$1.024 \times 10^2 \pm 9.529$	- 226 DPM
3748	5	cabinet welding lab	$4.070 \times 10 \pm 5.679$	- 9 DPM
3749	6	lab paper dispenser	$6.726 \times 10^2 \pm 3.661 \times 10$	- 1493 DPM
3750	7	lab work bench	$< 1.85 \times 10$	- 4 DPM
3751	8	Hot cell door	$4.644 \times 10^2 \pm 2.727 \times 10$	- 1031 DPM
3752	9	RAM 35	$6.245 \times 10^2 \pm 3.861 \times 10$	- 1386 DPM
3753	10	roll up door	$< 2.46 \times 10$	- 5 DPM
3754	11	machine shop table	$1.023 \times 10^3 \pm 5.682 \times 10$	- 5 DPM
3755	12	Ante room door	$8.361 \times 10^2 \pm 4.821 \times 10$	- 1856 DPM
3756	13	light ant. room	$2.4234 \times 10^4 \pm 1.0784 \times 10^3$	- 53799 DPM
3757	14	crane block	$2.691 \times 10^3 \pm 1.307 \times 10^2$	- 5974 DPM
3758	15	hot cell door	$9.252 \times 10^2 \pm 5.221 \times 10$	- 2053 DPM
3759	16	floor by hot cell	$3.123 \times 10^3 \pm 1.499 \times 10^2$	- 6933 DPM
3760	17	cabinet behind cell	$3.332 \times 10^3 \pm 1.590 \times 10^2$	- 7392 DPM
3761	18	hot cell room door	$5.8549 \times 10^4 \pm 2.5872 \times 10^3$	- 129980 DPM
3762	19	compaction	$5.824 \times 10^2 \pm 3.639 \times 10$	- 1272 DPM
3763	20	desk by main pool	$3.3366 \times 10^3 \pm 1.5947 \times 10^2$	- 7407 DPM
3764	21	amp pool southeast	$7.235 \times 10^3 \pm 3.312 \times 10^2$	- 16062 DPM

RKN

7/10/01

MARYLAND STATE DEPARTMENT OF HEALTH AND MENTAL HYGIENE
RADIATION LABORATORY REPORT
(410) 767-5537

SAMPLE SOURCE: NPI - Main Pool COLLECTOR: R. Nelson SAMPLE TYPE: Water
COLLECTION DATE: 06/13/01 RECEIPT DATE: 06/14/01 REPORT DATE: 07/05/01 ANALYSES BY: S. Wise

S. Wise

Activity (pCi/Liter)

LAB. No.CO-60

3765

 $5.0611 \times 10^4 \pm 2.6496 \times 10^3$ *112,360 DPM / Liter**RKN**7/10/01**Main pool*

MARYLAND DEPARTMENT OF THE ENVIRONMENT
Air and Radiation Management Administration
Radiological Health Program
2500 Broening Highway
Baltimore Maryland 21224
(410) 631-3300

RADIOACTIVE MATERIAL
INSPECTION FINDINGS AND LICENSEE ACKNOWLEDGEMENT

I. Licensee

Neutron Products Inc.
22301 Mt. Ephraim Road
P.O. Box 68
Dickerson, MD 20842

II. License No.

MD-31-025-01

III. Date of Inspection

6/13/2001
6/28/2001

IV. Inspection Findings and Licensee Action

The inspection was an examination of the activities conducted under your license as they relate to radiation safety and to compliance with the Code of Maryland (COMAR) 26.12.01 "Regulations for Control of Ionizing Radiation", and the conditions of your license. The inspection consisted of selective examinations of procedures and representative records, interviews with personnel, and observations by the inspector. The findings of this inspection are as follows:

- A. ☐ No current use or storage of licensed radioactive material (no program). The licensee was informed that upon receipt of radioactive material RHP must be notified.
- B. ☐ Issuance of an Agency E-1: Within the scope of the agency inspection no items of noncompliance or unsafe conditions were found. No action is required by the licensee.
- C. ☐ Issuance of an Agency E-2: Within the scope of the inspection, violations of minor significance were found. For any violation, corrective action must be immediately initiated. Within the 20 calendar days of your receipt of this notice you are to provide the Department with written statements of explanation describing:
- (1) corrective steps which have been or will be taken by you, and the results achieved or anticipated; (2) corrective steps which will be taken to avoid further violations; and (3) the date when full compliance will be achieved. Such a statement or explanation must be provided for each of the items listed.
- D. ☒ Issuance of an Agency E-1 with a letter sent to the licensee further describing Agency requirements. For any violation, corrective action must be immediately initiated.

V. Licensee Acknowledgement

The Inspector has explained and I understand any items of noncompliance identified during this agency inspection. Furthermore, I acknowledge that, if an Agency E-2 Description of Violations was issued, failure to comply may result in the revocation, suspension or modification of the license and possible fines for each day the violations continue.

6/28/2001

Date

Alan Jacobson

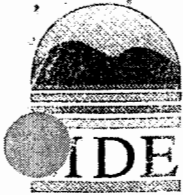
RAM Inspector

Licensee Representative - Title or Position

dpm/100cm² (licensee states due to radioprocessing recycle for D-II)
respirator maintenance check conducted monthly

MISCELLANEOUS

The licensee provided training documentation upon sign in to the facility. All visitors must initial that they have reviewed this documentation. Three pages of the intended documentation was not issued to the inspectors or other recent visitors (**concern**)



MARYLAND DEPARTMENT OF THE ENVIRONMENT

2500 Broening Highway • Baltimore, Maryland 21224
(410) 631-3000 • 1-800-633-6101 • <http://www.mde.state.md.us>

Parris N. Glendening
Governor

CERTIFIED MAIL: NOTICE OF VIOLATION

JUL 26 2001

Jane T. Nishida
Secretary

Jackson A. Ransohoff, President
Neutron Products, Inc.
22301 Mt. Ephraim Road
P.O. Box 68
Dickerson MD 20842

RE: Radioactive Material License #MD-31-025-01

Dear Mr. Ransohoff:

This letter refers to the radioactive materials inspection conducted by Messrs. Alan Jacobson, Ray Manley, Bob Nelson, Carl Trump, Jr., and Leon Rachuba of the Maryland Department of the Environment's (MDE) Radiological Health Program (RHP) on June 13 and 28, 2001. The inspection examined radiation safety, compliance with conditions of your license, adherence to procedures and proper maintenance of records, interviews with personnel, general observations, and independent measurements.

As a result of the inspection, the following concerns were identified:

1. NPI possesses five (5) teletherapy heads with "stuck" cobalt-60 sealed sources (in the shielded position) located in the courtyard area of the Limited Access Area (LAA). Please include with your compliance response, what NPI plans to do about this situation. Include what measures will be taken to try and recover the sources or plans for disposal of the units. According to the Radiation Safety Officer (RSO) some of these sources have been in storage for over 10 years. Radioactive material once determined to be useless and of no demonstrated economic value, is considered waste and should be treated accordingly. Furthermore, NPI currently stores in the main pool stellite corners containing approximately 25,000 curies of cobalt-60. Since this material does not have any apparent economic value, it should be declared as radioactive waste and shipped for disposal within four (4) years in accordance with license criteria. This is an unresolved concern identified during September 2000 inspection.
2. Inspectors identified poor radioactive waste storage practices and conditions such as rusted drums, drums lacking retaining rings, open waste containers, waste stored in plastic bags instead of drums, inadequate containment of contamination and eight (8) damaged drums caused by over compaction.
3. On June 13, 2001, NPI personnel issued MDE Inspectors written visitor safety instructions that were missing pages 2, 4 and 6 of 7 pages.

4. It appears that NPI does not have the sufficient trained personnel, financial resources and commitment of management necessary to establish compliance with Maryland Regulations, License Conditions and Court Orders.
5. NPI has not implemented a Quality Assurance Program, for manufacturing of sealed sources, in accordance with USNRC Reg. Guide 6.9.

During the inspection, certain activities were found to be in violation of the Department's requirements. The findings were discussed with Messrs. Jeff Williams, Bill Ransohoff, Marvin Turkanis and you on June 28, 2001. The violations found are listed in the enclosed "Description of Violations."

As a result of these findings, you are required to take immediate action to correct the violations and to respond to this letter and the enclosed "Description of Violations" within twenty (20) calendar days of your receipt of this notice. Written statements should be provided for the concerns and each of the violations indicating:

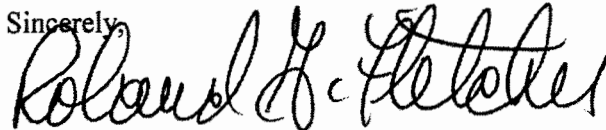
- a. Corrective steps, which have been or will be taken by you to remedy the present violations and the results achieved or anticipated;
- b. Corrective steps which will be taken to avoid further violations, who will undertake these steps, and who will supervise them; and
- c. The date when full compliance will be achieved.

Failure to provide these statements in the required time frame may result in the Department taking escalated enforcement action under Maryland Radiation Regulations to:

- (a) modify, revoke or suspend your license,
- (b) issue a Departmental Order under the Annotated Code of Maryland, Environment Article, Sections 1-301 and 8-101 through 8-601, and
- (c) seek an administrative penalty of up to \$1,000 per violation, per day [Section 8-150(b)], or a civil penalty in Circuit Court in an amount not exceeding \$10,000 per violation, per day [Section 8-509(b)].

Please be reminded that Departmental compliance letters and licensee responses shall be posted pursuant to the requirements of the Maryland regulations, Section J.11(d) titled, "Posting of Notices to Workers." If you have any questions concerning this letter, please call Messrs. Alan Jacobson or Carl Trump, Jr. at (410) 631-3301. You may also reach our office toll-free (in Maryland only) by dialing 1-800-633-6101 and requesting extension 3301. Also, you may contact this office via facsimile at (410) 631-3198.

Sincerely,



Roland G. Fletcher, Program Manager III
Radiological Health Program

ADJ
RGF/ADJ/cc

Enclosures: Description of Violations

DESCRIPTION OF VIOLATIONS

Neutron Products, Inc.
22301 Mt. Ephraim Road
P.O. Box 68
Dickerson MD 20842

RE: Radioactive Material License #MD-31-025-01

Certain activities conducted under your license were found to be in violation of the Code of Maryland Regulations 26.12.01.01 titled, "Regulations for Control of Ionizing Radiation." These violations are presented below:

1. Section C.31 titled, "Specific Terms and Conditions of License" and License Condition 22.B(2) which requires, in part, that all soils, wherever found contaminated by NPI licensed activities and exhibiting levels of cobalt-60 contamination exceeding 8 picocuries per gram above background must be removed by NPI and properly stored/disposed of as radioactive waste.

Contrary to Section C.31 and License Condition 22.B(2), NPI failed to remove cobalt-60 contaminated soil exceeding the above-specified limit. Specifically, on September 20, 2000 RHP inspectors collected soil samples at sites located both on and off of the NPI facility. Maryland Radiation Laboratory sampling results from these samples indicated that of the 10 samples taken, all indicated soil having cobalt-60 concentrations exceeding 8 picocuries per gram. The range was from 28 – 610 picocuries per gram of soil. NPI failed to remove the contaminated soils from the areas exceeding the license limit. This is a **REPEAT** violation from the Departmental inspections of November 1999 and September 2000. Furthermore, NPI has still not removed the soil contaminated with cobalt-60 from the adjacent railroad property to establish compliance with the 8.0 picocurie per gram concentration limit. Monthly soil samples collected and analyzed by NPI personnel in February, March, April and May 2001 indicate that soil concentrations continue to exceed the license limit. The Stipulation and Settlement (Civil Case No. 76639 in the Circuit Court of Montgomery County) dated January 3, 1994 required NPI to clean these contaminated areas by June 15, 1994. NPI has missed this deadline and has refused to remediate this property.

2. Section D.101 titled, "Radiation Protection Programs" states that in addition to complying with all other provisions of these regulations, a licensee shall use all means to maintain radiation exposures and releases of radioactive material as low as reasonably achievable (ALARA).

Contrary to Section D.101, the licensee failed to use all means necessary to maintain release of radioactive material as low as reasonably achievable. Specifically, NPI has failed to use means necessary such as the adequate containment of radioactive materials,

proper waste storage practices and regular shipments of radioactive waste, to a licensed repository. One only has to review the soil sample results referred to in violation #1 to determine that NPI is not maintaining control over their radioactive material and it is continuing to be released. In spite of curtailed source-manufacturing activities, NPI continues to release cobalt-60 into the environment in an uncontrolled manner.

3. Section C.31 titled, "Specific Terms and Conditions of License" and License Condition 21.B requires that within 90 days of the issuance of the license, NPI must submit to the Department for approval a comprehensive plan for disposal of all low level radioactive wastes in accordance with those specifications defined in this condition.

Contrary to Section C.31 and License Condition 21.B, NPI's low level radioactive waste plan was submitted to MDE on December 10, 1999; however, upon review it was found to be inadequate and as of this date a comprehensive plan acceptable to the Department has not been submitted. Deficiencies in the plan were discussed in a Departmental letter dated March 20, 2000, but NPI has not adequately responded to it. On October 20, 2000 the RHP received NPI's Decommissioning Plan dated October 27, 2000 which included a planned schedule for radioactive waste shipments. The RHP has reviewed this plan and determined that it is inadequate because it does not demonstrate compliance with the current radioactive material license waste disposal criteria. Table 2.1 of this plan describes a 12 year shipment schedule for only a small fraction of the total activity of current radioactive waste inventory. The plan did not describe the shipment schedule and protocol for the disposal of the contaminated soil in storage. All radioactive waste that was generated prior to August 1999 is required to be shipped for disposal by August 2004. This is a **REPEAT** violation from the Departmental inspection of November 1999 and September 2000.

4. Section C.29(c)(2) titled, "Financial Assurance and Recordkeeping for Decommissioning" requires, in part, that each licensee who is a holder of a specific license issued before October 15, 1998 and of a type described in paragraph (a) of C.29 must submit, on or before October 15, 1998 a decommissioning funding plan or a certification of financial assurance for decommissioning in an amount of at least equal to \$750,000. Also, the requirements of Section C.29(g)(2) requires that no person shall receive, possess, use, transfer, own, or acquire radioactive material of a type described in paragraphs (a) and (b) of C.29 for more than 180 days following the dates prescribed in the section for submittal of a decommissioning funding plan or certification, if the decommissioning funding plan or certification has not been approved by the Agency.

Contrary to Section C.29(c)(2), NPI has not met the \$750,000 certification by the specified dates of this regulation. Furthermore, NPI's decommissioning funding plan has not been approved by the Agency. Pursuant to NPI's failure to provide an adequate decommissioning funding plan or the \$750,000 certification by April 13, 1999 (180 days post October 15, 1998) NPI has continued to receive, possess, use, transfer, own, or acquire radioactive material of a type described in paragraphs (a) after the 180 day (April 13, 1999) deadline. This is a **REPEAT** violation from the Departmental inspection of November 1999 and the February 2000.

5. Section J.11(a)(4) titled, "Posting of Notices to Workers" requires, in part, that the licensee post any notice of violation involving radiological working conditions and any response from the licensee.

Contrary to Section J.11(a)(4), NPI failed to post their February 12, 2001 compliance response to the January 19, 2001 Departmental letter-Notice of Violation which described numerous violations found during the September 18-20, 2000 radioactive materials inspection.

6. Section D.101 titled, "Radiation Protection Programs" requires in part, that each licensee review the radiation protection program content and implementation at intervals not to exceed 12 months.

Contrary to Section D.101, NPI failed to conduct the annual review of the radiation protection program content and implementation for the calendar year 2000. Specifically, NPI has not conducted a review of the radiation protection program, content and implementation within the last 12 months.

7. Section D.302(b)(ii)(1) titled, "Compliance with Dose Limits for Individual Members of the Public" requires the licensee to show compliance with the annual dose limit for individual members of the public.

Contrary to Section D.302(b)(ii)(1), NPI failed to demonstrate by measurement, or calculation, or appropriate simulation model that the total effective dose equivalent to the individual likely to receive the highest dose from the licensed source of radiation does not exceed the annual dose limit as described in Section D. 301 for the calendar year of 2000.

8. Section D.902 titled, "Posting Requirements" which requires the licensee to post each radiation area with a conspicuous sign or signs bearing the radiation symbol and the words "CAUTION, RADIATION AREA" (CRA). Section D.902 requires the radiation symbol to use the colors magenta, purple or black on a yellow background.

- a. Contrary to Section D.902, NPI failed to post the required "CAUTION, RADIATION AREA" sign in the radiation area located near the windows of the welding shop.
- b. Contrary to Sections D.901 and D.901, NPI failed to properly post the radiation area located near the blue Sealand type container in the courtyard area of the LAA. The CRA sign was not conspicuous because it was rusted out and almost illegible. The sign did not have a yellow background and the radiation symbol was not visible.

9. Section D.904(a) titled, "Labeling Containers and Radiation Machines" requires in part, the licensee to ensure that each container of licensed radioactive material bears a clearly visible label bearing the radiation symbol and the words "CAUTION, Radioactive Material or "Danger, Radioactive Material".

NPI failed to properly label drums of soil containing cobalt-60 located in the courtyard area of the Limited Access Area with a clearly visible label bearing the radiation symbol and the words "CAUTION, Radioactive Material" or DANGER, Radioactive Material." Inspectors observed drums with no labels at all. Furthermore, the drums were stored outside, unprotected from the sun, wind, rain, snow, ice and extreme temperatures.

10. Section D.501 titled, "Surveys and Monitoring-General" requires a licensee to make or cause to be made, surveys that are necessary under the circumstances to evaluate radiation

levels, concentrations or quantities of radioactive material and the potential radiological hazards that could be present. License condition 22.C. requires NPI to conduct floor monitoring surveys on all surfaces within the facility outside of the LAA.

Contrary to the requirements of Section D.501 and License Condition 22.C, NPI failed to conduct floor monitoring surveys of the welding shop during the calendar year of 2000 and the first five months of 2001. Furthermore, no floor monitoring survey records of the welding shop were available for inspection.

11. Section D.1101 titled "Records-General Provisions" requires the licensee to use units of becquerel, grey, sievert, coulomb per kilogram, disintegrations per minute, rad, rem and roentgen and clearly indicate the units of all quantities on records required by Part D.

Contrary to the requirements of Section D.1101, the results soil sample surveys dated February 1, and 21, 2001, March 9, 2001, April 25, 2001, and May 16, 2001 were maintained in units of gross counts instead of picocuries. Furthermore, the efficiency of the counting system was not documented on the survey records. As a result, the records did not identify the samples which exceeded the 8.0 picocurie per gram limit.

12. Section C.31 titled "Specific Terms and Condition of License" and License Condition 17.A. require in part, a Health Physics Technician to ensure the proper use of the portal monitor, hand held frisker and any other devices employed to detect levels of radioactivity present on person or items which exit the LAA. License Condition 37 and Procedure R 2029 dated June 14, 1989 titled "Procedure For Exit From The Limited Access Area" requires in part, for one to frisk themselves or have a Health Physics Technician frisk them at the pancake probe frisking station located at the entrance to the clean shower room. Procedure R 2028 dated February 7, 1991 requires in part, for one to verify that the rate meter and the pancake probe in the clean room is operational prior to entering the LAA.

Contrary to the requirements of Sections C.31 and License Condition 17.A., the technician failed to ensure the proper use of the hand held frisker. The RSO failed to verify that the rate meter and the pancake probe located at the frisking station at the entrance to the clean shower room, were operational prior to entering the LAA. Upon exiting the LAA on June 13, 2001, MDE Inspectors identified that the hand held frisker was not operational, and it failed to respond to a radiation check source. Upon further review, it was determined that the detector was broken. Although a back up system was available, the RSO bypassed the clean shower room frisking station instead of replacing the defective detector. Then he walked through the clean shower room and used the frisking station located at the Helguson monitor.

13. Section C.31 titled, "Specific Terms and Conditions of License", License Condition 37 and Procedure 2028 titled "Procedure For Entrance To The Limited Access Area" prohibits eating, drinking, and smoking in all parts of the LAA. The June 23, 1988 Departmental Order states that the licensee shall immediately stop all eating, drinking and smoking in the offices and work areas of the LAA.

Contrary to Section C.31 and License Condition 27, on June 13, 2001, RHP inspectors found evidence that NPI employees were feeding a cat and a litter of kittens in the courtyard area of the LAA. Specifically, the inspectors observed a plate with chocolate cake that was passed through a window from the welding shop into the LAA. The RHP inspectors instructed the RSO to remove the feline family

from the LAA; however, on June 28, 2001 the cat and her litter were still living in this area where radioactive materials are stored.

Furthermore, on June 28, 2001 inspectors found evidence of food and drink in the Helguson monitor counting room, a room adjacent to and with direct access to the LAA. Specifically, a cracker wrapper was found on the floor and circular stained rings were found on the top of a cabinet. Also, disposable coffee cups, cracker wrappers and paper towels soaked in coffee were found in the waste can.

14. Section C.31 and License Condition 21.B.5. require NPI to provide the RHP and MDE's Hazardous and Solid Waste Management Administration copies of radioactive waste shipment records within 14 days of shipment dates.

NPI failed to provide the RHP and MDE's Hazardous and Solid Waste Management Administration copies of the June 23, 1001 radioactive waste shipment records within 14 days of shipment.

**MARYLAND DEPARTMENT OF THE ENVIRONMENT
AIR & RADIATION MANAGEMENT ADMINISTRATION**

Radiological Health Program

MEMORANDUM

TO: Alan Jacobson, Health Physicist Supervisor Radioactive Material Inspection & Compliance Section

FROM: Ray Manley, Health Physicist Supervisor Radioactive Materials Licensing Section, Radiological Health Program (RHP)

DATE: June 14, 2001

SUBJECT: **INSPECTOR SUMMARY FOR June 13, 2001 NEUTRON PRODUCTS, INC. INSPECTION**

The following subject matter was reviewed at NPI pursuant to licensee activities conducted in the Limited Access (LAA) and surrounding areas.

1. Compactor
2. Radioactive material waste management
3. Previous inspection violations and concerns
4. Status of operational systems in the LAA
5. LAA surveys (documentation by RKN)

COMPACTOR

Compacting at NPI is being conducted by authorization of NPI procedures as permitted by amendment 44 of the 01 license. NPI started use of the new compactor on 10/21/2000. The licensee is using the compactor in the assistance of meeting current Circuit Court shipping deadline requirements and 01-license condition 21 shipping deadlines. The licensee stated that they intend to meet the Court Order June 30, 2001 deadline. The shipping deadlines are reviewed in the subsequent item in this report. To the date of this inspection, the licensee has compacted 12 drums at a compaction rate between 5-1 and 7-1. Discussions with the RSO indicate unsuccessful attempts by the licensee to increase the compaction rate higher than 7-1 however, these attempts resulted in bulging drums and failure of the inner retention devices (**concern**). The licensee admits that eight out of the first 12 drums NPI compacted sustained some level of damage (imperfections) pursuant to this attempt to overstuff the drums. The licensee has desisted in this overstuffing technique. The

RSO stated that he anticipated an approximate total of 19 compacted 55 gallon drums with approximately 229 millicuries of C0-60 to be included in the prior to June 30th shipment. Current NPI individuals trained for and conducting compacting activities are Jeffrey Williams, Richard Demory, Bill Ransohoff and Brad Young. As per the procedures, all operators are using full-face respirators. High volume air sampling conducted during compactor operations indicates low airborne concentrations (average concentrations in 10^{-10} uCi/cc range). No lapel samplers are being used during operations to evaluate breathing zone (**concern**). Licensee states their evaluation by counting respirator filters is unreliable because of transfer of hand contamination to the filter. Initial meter surveys are conducted prior to and during operations. Eight contamination smears taken in areas around the compactor by the licensee following operations have indicated levels of contamination below operational procedure limits. There was one contamination incident pursuant to pre-compacted waste. On June 4, 2000, compactor operators sorted through uncompacted boxes of waste to remove disposed of aerosol cans. This activity was conducted without the knowledge of the RSO who was not at the site at the time. The operation created significant level of personnel contamination (**concern**). Dose-rates of compacted drums average 130 mR/hr at a meter with a maximum contact dose-rate of 1200 mR/hr. All operators use extremity dosimetry. The RSO stated that the compactor has had no malfunction problems of any kind since the inception of its use. The RSO stated that when waste of multiple generation dates is compacted the drum is labeled with the date of the oldest waste. However, this inspector was not able to visually inspect any compacted drum for labeling or potential damage because the licensee has stored the compacted drums in the rear of the South waste room with approximately a dozen empty drums in front of them and with a dose-rate at the waste room door of approximately 1 R/hr (**concern**).

RADIOACTIVE MATERIAL WASTE MANAGEMENT

Summary of NPI shipping requirements:

NPI must ship by Court Order, 600 cubic feet of low activity waste by June 30, 2001. By June 30, 2002, NPI must ship at least 80 % of the remaining low activity waste activity waste stored at the facility. NPI must by 01 license condition 21 ship out all RAM waste (stored outside the pool) generated after August 1999 within two years of its generation date (first deadline August 2001). For waste generated after August 1999 (stored in the pool) the licensee must ship this waste within three years of its generation (first deadline August 2002). All the radioactive material waste generated by the licensee prior to August 1999 must be removed from the facility by August 2004.

Summary of proposed prior to June 30, 2001 waste shipment

The RSO indicated that the waste shipment would include 19 drums of compacted waste in 55-gallon drums with activity of 229 mCi and boxes containing uncompacted waste. The total estimate of shipped activity is 500 mCi. The RSO indicated that the waste shipped would include some of the prior to August 1999 waste and waste generated after August 1999. The waste is to be loaded into a NPI lead shielded exclusive use truck container and shipped as LAA to ATG for reduction by incineration (50-1 to 100-1) and subsequently shipped for burial to Envirocare. This container will be locked and stored in the unrestricted parking lot during loading and prior to NPI transport (**concern**).

NPI waste storage practices in the LAA

This inspector identified a number of concerns with waste storage practices in the LAA. There is a significant amount of radioactive material waste and/or sources being stored in the courtyard and not in the two radioactive material waste rooms (**concern**). Outside of the storage rooms is the following storage:

18 B-25 boxes of radioactive material soil (approximately 96 cubic feet apiece)

54 55-gallon drums of radioactive material soil (approximately 7.5 cubic feet apiece)

2 locked truck trailers (Sealand type) containing a portion of the above drums.

Large locked blue trailer (Sealand type) containing 46 boxes of uncompacted waste. (for prior to June 30, 2001 shipment and six C0-60 sources jammed in teletherapy heads.

55-gallon waste container of uncompacted waste removed from south waste storage room to allow for storage of empty compactor drums (labeled as Yellow-II).

B-25s All soil in the B-25s was not secured (**concern**). B-25s filled post to August 1999 are tag labeled with isotope, date of removal and estimate of activity (all .2 mCi) and a "CRAM". B-25s filled prior to August 1999 were stenciled on the side indicating radioactive soil. One of the B-25 lids was slid open approximately 5-inches (reason unknown by RSO) (**concern**). This would appear to allow water access into the unit during a rainstorm. Other evidence of this was noted in another B-25 that had approximately 3-inches of water on top of the soil in the container (**concern**).

55-gallon drums. No retaining rings were noted on any drums containing soil (**concern**). There was a significant level of rust on the drums some to the point of the entire drum being brown instead of the usual black color (**concern**). Many drums were not labeled as to any aspect of their contents (**concern**).

Large blue Sealand type. Dose rate at contact was 90 mR/hr. Dose rate at 30 cm was 50 mR/hr. The only labeling was almost nonlegible (rusted) CRA sign on front of the unit. No radiation signage coloration was visible and the radiation symbol was totally illegible (**concern**).

Approximately 4 yellow plastic bags containing LLW were noted stuffed in the rear of the North Waste room. NPI had previously indicated that all bagged waste of this type would be drummed due to a history of deterioration of the plastic. The RSO stated that all other bags had been drummed, however during the waste room cleanout they had discovered more. No explanation was given as to why the bags were not subsequently drummed (**concern**).

PREVIOUS INSPECTION VIOLATIONS AND CONCERNS

An interview was held with Mat Repp in the LAA. Mr. Repp indicated that he was now familiar with the roughing filter change procedure. He showed a number of documents in the hot cell log indicating proper documentation of a roughing filter change in accordance with the procedures. He showed that a copy of the procedure is now located in the LAA.

STATUS OF OPERATIONAL SYSTEMS IN THE LAA

Mr. Williams as RSO indicated that he is getting into the LAA only 4 times a month (**concern**). An interview with Jeff Corun (hot cell operator) indicated that the current activity in the hot cell was the recycling of radiation processing sources prior to transfer into the D-1 irradiator. He indicated he can process approximately 14 of these sources in two days. He also indicated that the recycle process and transfer had recently been completed for the D-II irradiator.

The licensee has a daily LAA checklist that includes check of the LAA for stray animals in the area. NPI has had previous problems with potential animal vectors through dogs and birds. The LAA inspection team observed a female cat and litter located in the rear of the LAA courtyard area adjacent to the North wall of the welding shop (**concern**). Adjacent to the cats was evidence (food containers) that NPI personnel from the welding shop had been feeding the animals. Inspection of the welding shop indicated two uncontrolled entrances into the LAA from the shop via large windows that crank open. This appears to show a lack of control by NPI management regarding access into the LAA. (**concern**). The welding shop is a restricted area, however, surveys at the window indicated a dose rate of 7 mR/hr. There was no "CRA" sign posted in the area (**concern**).

When exiting the LAA it was determined that the initial contamination frisker was not operational (**concern**). The RSO indicated that the initial frisking activities had been moved to the frisker outside of the HECM because of temporary activities in the LAA raising the background in the frisker area and he was unaware of the fact the unit was nonoperational. Use of the HECM area frisker appears to potentially allow transport of significant contamination past the shower area (**concern**). The RSO subsequently determined that the initial frisking station could be made operation by replacing the detector.

LAA parameters 2001

pH 5-6

conductivity 1-5 u/Siemens-cc

pool activity max 8×10^{-4} uCi/cc avg. 6×10^{-5} uCi/cc

large volume air sampling maximum 1.7×10^{-7} uCi/cc

monthly dumpster surveys—background

minipump airborne (hot cell) 1.1×10^{-13} uCi/cc

since 9/2000 all meters calibrated on quarterly frequency

inventory and leak test of sealed sources last conducted 3/28/2001 all $< .005$ uCi

contamination smears maximum noted in March 2001 to rear of hot cell door 606,000

dpm/100cm² (licensee states due to radioprocessing recycle for D-II)
respirator maintenance check conducted monthly

MISCELLANEOUS

The licensee provided training documentation upon sign in to the facility. All visitors must initial that they have reviewed this documentation. Three pages of the intended documentation was not issued to the inspectors or other recent visitors (**concern**)

J. JOSEPH CURRAN, JR.
ATTORNEY GENERAL

DONNA HILL STATON
DEPUTY ATTORNEY GENERAL

CARMEN M. SHEPARD
DEPUTY ATTORNEY GENERAL

M. ROSEWIN SWEENEY
PRINCIPAL COUNSEL

KATHY M. KINSEY
DEPUTY COUNSEL

WRITER'S DIRECT DIAL NO.
(410) 631-3036



OFFICES OF
THE ATTORNEY GENERAL
DEPARTMENT OF THE ENVIRONMENT
2500 BROENING HIGHWAY
BALTIMORE, MARYLAND 21224
FAX: (410) 631-3943

LYNN R. ANGOTTI
ANDREA SAUM BAKER
NORMA JEAN KRAUS BELT
TERRILYN E. BROOKS
DAVID R. BURKE
ELLEN W. COHILL
JOHN VAN LEAR DORSEY
ROBERT FIELD
LORRAINE HERSON-JONES
FRANK R. LEVI
SHEILA LUNDY-MOREAU
KENNETH D. PACK
JUDITH S. SINGLETON
DEBRA A. SMITH
ADAM D. SNYDER
JENNIFER L. WAZENSKI
STEPHANIE COBB WILLIAMS
NANCY W. YOUNG
ASSISTANT ATTORNEYS GENERAL

JACQUELINE S. RUSSELL
STAFF ATTORNEY

March 8, 2001

Margaret Hottensen, Acting Director
Office of Site Remediation
Office of Regional Counsel
U.S. Environmental Protection Agency
Region III
1650 Arch Street
Philadelphia, PA 19103-2029

Abe Ferdas, Director
Hazardous Site Cleanup Division
U.S. Environmental Protection Agency
Region III
1650 Arch Street
Philadelphia, PA 19103-2029

Dear Ms. Hottensen and Mr. Ferdas:

This is in follow-up to our telephone conversation with your staff on February 27, 2001. The Maryland Department of the Environment (MDE) is interested in discussing with EPA certain environmental issues and concerns involving low-level nuclear facilities owned by Neutron Products, Incorporated ("Neutron") located in Dickerson, Montgomery County, Maryland. These facilities are currently the subject of on-going litigation in the Circuit Court for Montgomery County. Neutron is the holder of several licenses from the State of Maryland for these facilities.

By way of background, the license at issue in the Circuit Court case is a manufacturing license (the "01" license) that allows Neutron to handle bare unsealed radioactive material and to manufacture radioactive sources for use in teletherapy equipment. Neutron has failed to provide statutorily-required financial assurance for decommissioning of its 01 license, and the State recently brought suit to terminate Neutron's operations under the 01 license for this failure. In November of 2000, the Circuit Court issued a permanent injunction prohibiting further operation under the 01 license due to Neutron's failure to provide financial assurance and based upon the entry of partial summary judgment in the matter.

Neutron has appealed the injunction to the Maryland Court of Special Appeals. The Circuit Court modified the injunction to allow some continued operations during the appeal. We anticipate that the appellate process will take six to eight months and, at the end of this period, the appeals court will issue a mandate affirming the lower court's order, thereby terminating Neutron's operations under the 01 license.

Neutron also has three other operational licenses at the site that are not directly involved in this particular Circuit Court action. It has two irradiator licenses allowing only the handling of sealed sources (the "04" and "05" licenses), and a service license (the "03" license) allowing it to exchange radioactive sources at its customers' sites. Neutron is not currently in violation of the financial responsibility requirements with respect to these three licenses.

MDE representatives met with EPA some time ago regarding Neutron and would like to continue to explore with EPA the possibility that, at some time in the future, it may become appropriate or necessary for EPA or MDE, or both, to initiate actions at this site. These actions could include, but not necessarily be limited to, an action to address low level nuclear waste that has accumulated on the site. The most likely trigger for such an action would be the financial condition of Neutron after the entry of the Court of Special Appeals order.

At this time, we would like to explore with EPA the parameters under which EPA would conclude that a federal response action is justified. We believe that such discussions will assist EPA and MDE in coordinating their activities and efficiently allocating their respective resources. In this regard, we would also be interested in discussing with you the possibility of coordinating our efforts in doing a search for Potentially Responsible Parties.

I hope that this letter can serve as a sufficient basis for further discussions with EPA staff. I have sent to Diane Aji in the Regional Counsel's Office a copy of our expert's estimates of the cost of cleaning up the site and copies of the referenced Circuit Court orders. If there is any further information that may help you with these issues please let us know. After you have discussed these matters, we would appreciate the opportunity to schedule a conference call with the appropriate parties.

Please feel free to contact me with any questions; Assistant Attorneys General Rosewin Sweeney and Judith Singleton are also familiar with this matter. We may be reached at (410) 631-3048.

Sincerely,



Robert Field
Assistant Attorney General

RF/jss

cc: Diane Aji, Regional Counsel's Office, EPA
Renee Sarajian, Regional Counsel's Office, EPA
Charles Howland, Regional Counsel's Office, EPA
Richard W. Collins, Director of WAS, MDE
Ann Marie DeBiase, Director of ARMA, MDE

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March 8, 2001

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Robert Field
Assistant Attorney General

RF/jss

cc: Diane Aji, Regional Counsel's Office, EPA
Renee Sarajian, Regional Counsel's Office, EPA
Charles Howland, Regional Counsel's Office, EPA
Richard W. Collins, Director of WAS, MDE
Ann Marie DeBiase, Director of ARMA, MDE

NEUTRON PRODUCTS inc

22301 Mt. Ephraim Road, P. O. Box 68
Dickerson, Maryland 20842 USA
301-349-5001 FAX: 301-349-5007
e-mail: neutronprod@erols.com

November 6, 2000

Mr. Ray Manley
Radioactive Materials Licensing and Compliance Division
Radiological Health Program
Department of the Environment
State of Maryland
2500 Broening Highway
Baltimore, Maryland 21224

VIA FAX 410/631-3198

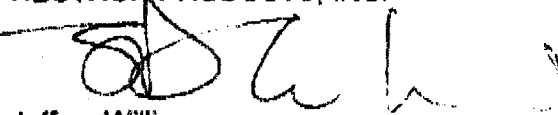
Re: Radioactive Material License Number MD-31-025-01

Dear Mr. Manley:

Per our conversation of November 2, 2000, please find enclosed information relevant to the off-site contamination discovered during a routine environmental survey conducted last Thursday. Please call if you have any questions.

Very truly yours,

NEUTRON PRODUCTS, INC.



Jeffrey Williams
Radiation Safety Officer

Enclosures

NEUTRON PRODUCTS, INC.

22301 Mt. Ephraim Road, P.O. Box 68

Dickerson, MD 20842

301-349-5001 FAX: 301-349-2433

FAX LEAD PAGE

COMPANY:

MDE - RHP

TO:

RAY MANLEY

(Provide copy to: _____)

Date / Time: 11/6/00 / 1FAX Tele. No. 410 631 3198# of Pages: 6 (Incl. Lead Pg.)NPI FAX Log. No. 00 252

FROM:

G. D. WilliamsSUBJECT/
MESSAGE:If FAX is incomplete or illegible, please contact us at 301-349-5001

72 11/6 00

NEUTRON PRODUCTS inc

22301 Mt. Ephraim Road, P. O. Box 68
Dickerson, Maryland 20842 USA
301-349-5001 FAX: 301-349-2433

31 October 2000

Mr. Carl Trump
Radiological Health Program
Maryland Department of the Environment
2500 Broening Highway
Baltimore, MD 21224

Re: MD-31-025-01

Dear Mr. Trump,

I am writing to certify that Jeffrey Williams conducted the random inspection for the month of September on 28 September 2000. I have also enclosed Bob Alexander's report for the month of September.

In order to fulfill our reporting requirements under License Condition 15C, in the month of September there were no HECM readings exceeding 22,000 dpm.

Routine soil surveys were taken on 28 September and lightly contaminated soil was found north of the LAA courtyard. In addition to the routine soil sampling, additional samples were taken on September 20 and 29. The highest levels of contamination were found in the drypond. Lower levels of contamination were found beyond the rip-rap downstream of the drypond, along the abandoned rail siding, in the broken drainage pipe and west of the LAA courtyard fence. The data is available for your review. All levels of contamination found were consistent with those found on previous occasions, and do not represent a radiological hazard.

The routine environmental survey performed on a section of our property every month revealed no spots of cobalt-60 contamination. The survey for September was conducted on the northeast area of the property.

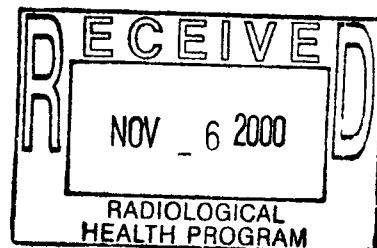
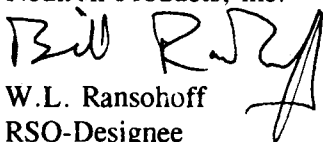
The off-site survey for September was conducted on 29 September on property not previously surveyed by Neutron and revealed no spots of contamination. Survey records are available for your review.

If this report is inadequate in any way, or if you need additional information, please let me know.

Sincerely,

Neutron Products, inc.

W.L. Ransohoff
RSO-Designee



HP CONSULTANT REPORT FOR SEPTEMBER 2000

Introduction

On September 28, 2000, I visited the LAA at NPI to perform an audit of the current radiation protection situation. I found no unsafe conditions. As has always been the case during my visits, unusually good housekeeping was in evidence. RSO Jeff Williams and I performed radiation surveys in the court yard area, including exposure rate measurements in and around the large, walk-in storage containers being used for radioactive waste. Not including the areas in front of the waste room doors, we found no rates higher than 20 mR/hr.

1.0 High Efficiency Filters

1.1 Hot-Cell Exhaust System

The primary high efficiency filter serving the hot-cell exhaust system is replaced when either the pressure drop across it, or the dose rate from it, exceeds pre-determined levels. The filter was changed during September because of the pressure drop. The dose rate was considerably lower than usual; it was estimated that the filter contained only 71 mCi of Co-60 this time. The work was performed by three employees who normally work in the LAA. The collective dose for the task, as determined by self-reading dosimeters, was 230 mrem; the highest individual exposure was 95 mrem.

While I was there, an LAA worker was replacing the motor and bearings on the primary blower. In addition, a variable speed drive has been installed to provide for increased fan speed when the hot-cell door is open to improve the ventilation system particle-capture efficiency. This was a 2-day job, with the worker expected to receive between 110 and 170 mrem/day. The maximum dose rate in the vicinity of the equipment was 450 mR/hr. My impression was that this worker is very conscious of and knowledgeable regarding health physics procedures. But even the most experienced

people can become overly engrossed in their work and unmindful of dose and contamination control measures. That is not at all un-common, and that is why I believe intermittent surveillance should always be performed by the LAA health physics technician. It's the first thing I was taught to do—46 years ago.

Some time ago I happened to be in the

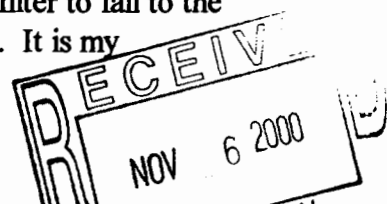
LAA at the time of a power failure. There was a delay of several seconds before power was restored by the emergency generator. Since the pre-filter in the cell is held in place by the pressure difference between the cell and the duct leading to the high efficiency filters, I inquired as to whether the lapse of power had allowed the pre-filter to fall to the floor. I was told that it had. It is my

**RADIATION
PROTECTION**

at

**NEUTRON
PRODUCTS**

Prepared by R.E. Alexander, CHP



understanding that a retaining bar is soon to be installed to hold the pre-filter in place.

1.2 New Compactor

I was shown the newly installed radioactive-waste compactor by RSO Jeff Williams. It is located in the decontamination room (between the room behind the hot-cell and the hot-tool storage room). In preparation for the installation the floor of the decontamination room was leveled (pan removed and its cavity filled with concrete), and a sealant was used to paint the room floor. I looked carefully at unit's air exhaust system to evaluate the design features employed to maintain a seal around the filter frames. It looks to me like a better-than-usual design. Williams told me that the efficiency of the filters and their installation will be evaluated using a DOP test aerosol before the unit is used. The filtered air will be discharged into the room behind the cell and will therefore also pass through the hot cell ventilation system prior to release. With double high efficiency filtration, I doubt that the annual radioactivity discharge can be increased significantly. The discharge for 1999 was only 6 μCi . Williams also pointed out that the design of the compactor air handling unit, rather than providing for one large filter, provides for two small ones. This will enable the spent filters themselves to be readily compacted.

Compactor operators will not be exposed to high dose rates from stored hot tools. Most of the sources contributing to the dose rate in the decontamination room have been removed from the hot-tool room, and those that remain are now positioned behind the considerable shielding afforded by the room walls. The dose rate while I was there was measured to be 75 mR/hr maximum at the outside of the door, and of course much lower where a compactor operator would be working. Williams does not anticipate any

future need for positioning hot tools where direct radiation could reach the door. I requested a copy of the health physics procedure for initial startup of compactor operations.

My experience with compactors taught me that the most difficult problem to anticipate is re-expansion of the compressed material — a self-defeating difficulty that has to be overcome, but without violating the integrity of the container. The designers of this new compactor decided to employ disks of slightly smaller diameter than the waste drums. The disks are lowered into place by the compression piston itself during every compression action. At the end of the piston travel the disks are held in place by friction that is generated by five rubber structures attached every 72° to the edge of each disk.

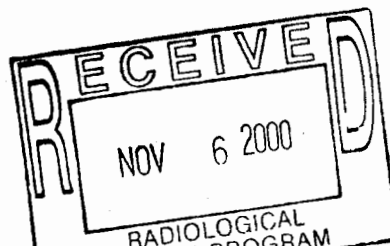
2.0 Dosimetry

2.1 Occupational Dosimetry Services

The Eberline company that has for several years been supplying TLD dosimeter badges for NPI workers has been acquired by Landauer and will no longer offer this service. Landauer has been supplying visitor badge services and is interested in expanding these services to NPI to include worker dosimetry. At the time of my visit NPI personnel had not yet made a decision regarding the new supplier.

2.2 Electronic Self-Reading Dosimeters

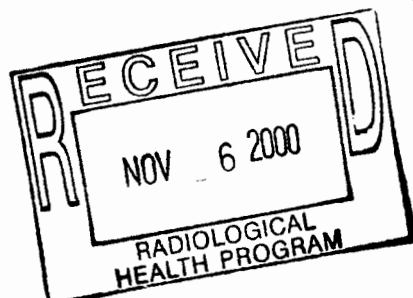
The NPI staff has enjoyed a great deal of dose-control success using electronic self-reading dosimeters (SRDs). A decision has been made to use them in additional ways, e.g., LAA staff; and ten new SRDs have been ordered.

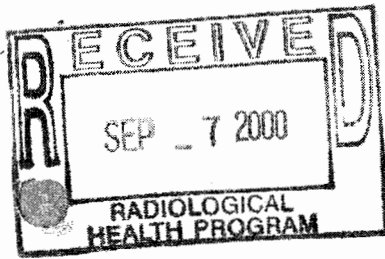


3.0 Training

Jeff Williams has requested regulatory radiation and contamination controls as the

topic for the final quarterly training session of the year, which is scheduled for December. It is his policy to devote one class each year specifically to this subject. All employees whose work involves MDE-licensed activities are expected to maintain familiarity with pertinent provisions of Regulations for the Control of Ionizing Radiation, Part D — Standards for Protection Against Radiation.





Ken 9/8/00

NEUTRON PRODUCTS inc

22301 Mt. Ephraim Road, P. O. Box 68
Dickerson, Maryland 20842 USA
301-349-5001 FAX: 301-349-2433

31 August 2000

Mr. Carl Trump
Radiological Health Program
Maryland Department of the Environment
2500 Broening Highway
Baltimore, MD 21224

Re: MD-31-025-01

Dear Mr. Trump,

I am writing to certify that Marvin Turkanis conducted the random inspection for the month of July on 18 July 2000 and that the report is available for your review. In addition, I have enclosed Bob Alexander's report for the month of July.

In order to fulfill our reporting requirements under License Condition 15C, in the month of July there was one HECM reading exceeding 22,000 dpm. On 10 July 2000, a shoe cover worn by #019 counted 73,738 dpm. As this is more than 50,000 dpm, it was promptly reported to RHP as required by License Condition 17D.

Routine soil surveys were conducted and contaminated soil was found in the west end of the dry pond. In addition to the routine soil sampling, additional samples were taken on July 2, 5, 6, and 15. Sample locations were focused on areas undergoing remediation, including the stone trap and the area west of the Courtyard fence which had been substantially remediated in June. The highest levels of activity were found in the stone trap. The data is available for your review. The levels of contamination found in the area west of the Courtyard fence were used to direct follow-up remediation efforts. The levels of contamination found in the stone trap were consistent with those found there on previous occasions, and do not represent a radiological hazard.

The stone trap remediation was conducted on July 2, 3 and 15 and it is estimated that approximately 320 μ Ci were removed. That material is now stored in the LAA. It is estimated that the continuing remediation of the area west of the Courtyard fence removed 3 drums containing approximately 30 μ Ci. The drums are stored in the LAA.


The routine environmental survey performed on a section of our property every month revealed no spots of cobalt-60 contamination. The survey for July was conducted on 31 July and focused on the northeast area of the property.

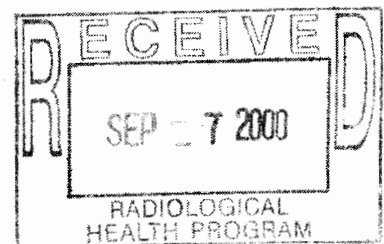
The off-site survey for July was conducted on 10 July and revealed a spot of contamination. As you know, Neutron promptly removed the contamination, notified RHP of its findings and submitted a letter to the property owner. As a result of the findings and at the prior

Mr. Carl Trump
31 August 2000
Page 2

suggestion of the property owner, Neutron conducted an additional July survey on a parcel of public property in the same general area. No cobalt-60 contamination was found. Survey records are available for your review.

If this report is inadequate in any way, or if you need additional information, please let me know.

Sincerely,

W.L. Ransohoff
RSO-Designee



NEUTRON PRODUCTS inc

Ken 1/5/2000
NEUTRON PRODUCTS inc

22301 Mt. Ephraim Road, P. O. Box 68
Dickerson, Maryland 20842 USA
301-349-5001 FAX: 301-349-2433

30 December 1999

Mr. Carl Trump
Radiological Health Program
Maryland Department of the Environment
2500 Broening Highway
Baltimore, MD 21224

Re: MD-31-025-01

Dear Mr. Trump,

I am writing to certify that I conducted the random inspection for the month of November on November 30, 1999 and that the report is available for your review. I have also enclosed Bob Alexander's monthly report for November, 1999.

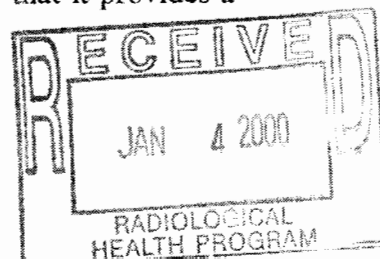
In order to fulfill our requirements under License Condition 15C of the new license, I have consulted with Jeffrey Williams, the Radiation Safety Officer for the 01 license. In the month of November, there was one HECM incident exceeding 22,000 dpm. It occurred on November 23 and was found on Matt Repp's elbow. The contamination totalled 25,200 dpm and was removed by washing the effected area.

In accordance with Condition 22.B.2, during the month of November, contaminated leaves and/or soil was found on the roof of the LAA, in the stone trap, in and around the dry pond and in areas downstream thereof.

Only a small amount of dirt and leaves was removed from the LAA roof primarily because the roof was still relatively clean from previous leaf/soil removal efforts. The material has been stored in LAA as radwaste. The survey and removal were performed 11/30/99.

The clinoptilolite in the stone trap and in the dry pond discharge was washed and returned to service. The dirt which was washed off of the clinoptilolite was placed in the LAA as radwaste. The remediation was performed on 11/27 and 11/28.

On November 18, 19, and 23 significant remediation was conducted on the dry pond and on the area downstream thereof (both inside and outside of the fence - see the attached drawing for specific areas remediated). More than 500 cubic feet of soil was removed and it is now stored in the LAA as radwaste. As is customary with the contaminated soil which we remove, the soil is so low in activity that it provides a useful purpose as a shielding material within the LAA.



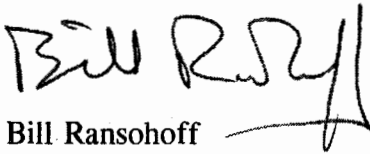
Mr. Carl Trump
30 December 1999
Page 2

The off-site survey for the month of November was performed on property not previously surveyed by Neutron and yielded no areas of contamination.

If this report is inadequate in any way, or if you need additional information, please let me know.

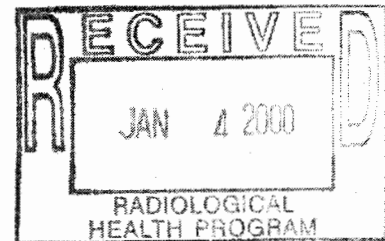
Sincerely,

Neutron Products, inc.



Bill Ransohoff

Enclosures



NEUTRON PRODUCTS inc

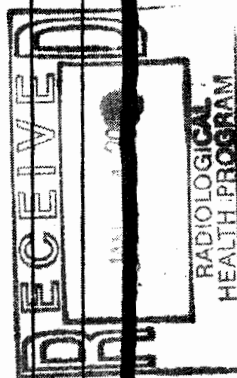
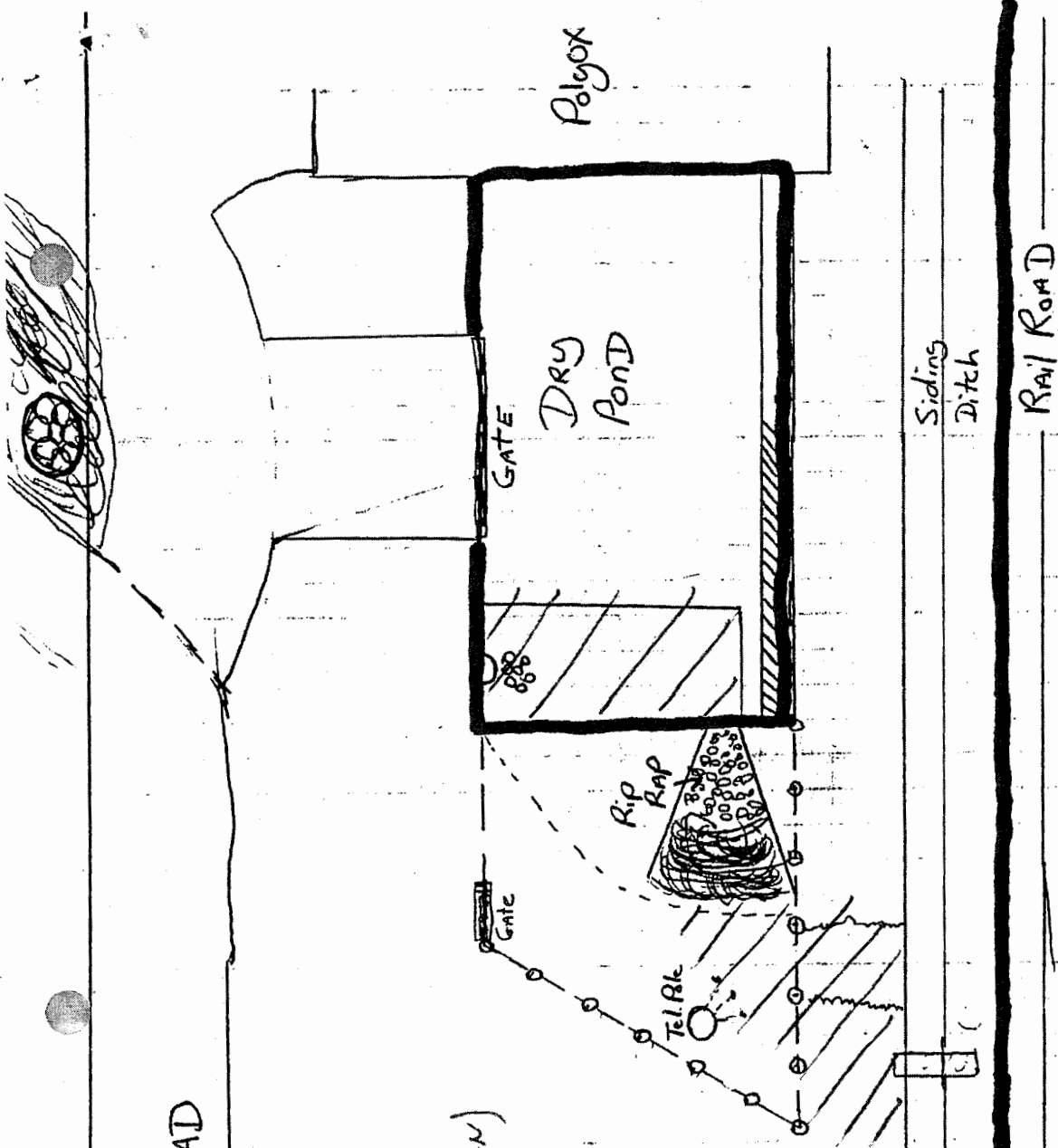
MT. EPHRAIM ROAD

○ Tel Pole

AREAS OF REMEDIATION
(NOVEMBER, 1999 CAMPAIGN)

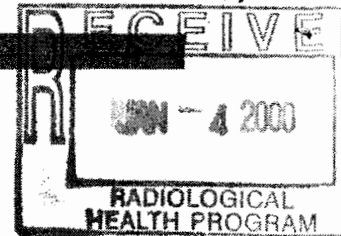
- T310 R521
12/30/99

○ Tel Pole



Rem 1/5/2000

HP CONSULTANT REPORT FOR NOVEMBER 1999



Introduction

On November 30, 1999, I performed a radiation protection audit of the LAA at NPI and held discussions with Jeff Williams and Bill Ransohoff.

1.0 Dry-Pond Remediation

Dry-pond remediation is now receiving high priority at NPI.

1.1 Removal of Contaminated Soil

A large quantity of soil was removed from the Dry Pond during November. Dose rates at 3 feet above the surface were reduced significantly. The bulk of the soil removed was packaged in B-25s and is now stored in the LAA courtyard. A smaller portion was transferred to the courtyard in supersacks of the type previously used for this purpose. These bags are known by previous experience at NPI to retain their confinement integrity for several months. Jeff Williams told me the intent with respect to long-term storage is to transfer the soil to B-25 containers.

1.2 Reducing the Amount of Co-60 Discharged to the Dry Pond

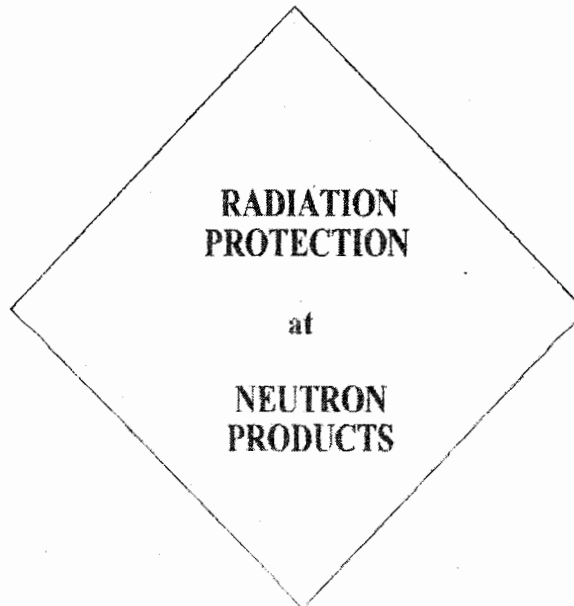
I was pleased to observe during this visit that the problem of Co-60 migration from the

courtyard surface (apparently) to the dry pond is receiving attention in detail from higher-level technical and management personnel, viz., Jeff Williams and Bill Ransohoff. In discussions with them regarding what they are learning I became optimistic about finding a solution. For example, investigations in progress are providing evidence that the radionuclide reaches the pond attached to molecules of humic materials found in soil. Such attachments could form in small soil deposits in the courtyard area and/or within the "stone trap" located below grade in the runoff path between the courtyard and the dry pond. The highest concentrations of cobalt are

being found in a black silt-like substance near the runoff entrance to the dry pond. Williams points out that the cobalt could work its way further into the pond area through ion-exchange mechanisms. At this point in the investigation the indicated solution is better decontamination of the runoff, by supplementing the "stone trap" with a decontaminating (ion exchange) agent, and

some plastic packing material which will hopefully remove the contaminated dirt and be much easier to clean and reuse. I had always supposed the cobalt simply to be dissolved or entrained in rainwater.

In a memo on the subject "Dry Pond/Stone Trap Remediation" dated November 29, 1999, Bill Ransohoff reports early results of his



investigations of clinoptilolite as a candidate decontaminating agent. Clinoptilolite gravel placed in the "Stone Trap", when recovered and washed using tap water, produced a slurry of approximately 3,300 pCi/g. The cleaned clinoptilolite contained only 122 pCi/g. Clinoptilolite was also tested at the point of discharge from the dry pond. The slurry washed from this clinoptilolite contained 227 pCi/g. 115 pCi/g was found in leaves and dirt samples taken near the clinoptilolite at the point of discharge.

At this stage it seems to me that while a worthwhile degree of decontamination may very well be achievable at the "stone trap" location, a practical way of reducing the amount of cobalt leaving the courtyard in runoff is also needed. I suggested looking into the feasibility of periodically decontaminating the courtyard area using a high-pressure, small-diameter, low volume stream of water. Such a stream would remove considerably more soil and humus than even a torrential rain. This suggestion assumes that a practical way can be found to collect this water from the stream before, or immediately after, it reaches the courtyard drain. It also assumes that the water collected could be disposed of at lower cost than the disposal of soil removed from the dry pond (\$20 per ft³). Williams and Ransohoff may consider this possibility.

2.0 Training

2.1 Orientation Handout

RSO Jeff Williams has identified a need to augment the literature given to new NPI employees in connection with the orientation process with a new handout covering much of the material in the lecture. He is performing this task himself and expects to complete it soon.

2.2 Firefighter Training

During October and November NPI personnel conducted four training sessions for local firefighters. Jeff Williams reports that they are much better equipped now, including radiation detection and measurement instrumentation. The NPI training included the understanding and interpretation of survey meter readings, with emphasis on how to use the instruments appropriately. Interactions of this nature seem to be resolving some of the questions that might *unnecessarily* prevent firefighters from performing their duties should a fire break out at the facility. There is little, if any, reason to believe now that they might stay too far from a fire to control or extinguish it even though no significant radiation risk was involved. Boundaries specifying where to stop and wait for a Haz-Mat team have been moved inward to more reasonable distances.

3.0 HECM Background

At my request Jeff Corun measured background levels at the HECM location. The highest level found was 15 μ R/h; the highest permissible background is 50 μ R/h. No operational problems have arisen since my last audit. A technician from the Helguson Company came to NPI in October for purposes of semiannual maintenance. He told Corun that their will be no Y2K problem.

I reviewed the HECM background records for October, 1999. The printouts provide background rates at each detector on a daily basis. The rate at the detector having the maximum rate is shown in Table I for each day in October. All of the maxima occurred at Detectors 1 (feet) and 2 (hands) — primarily at Detector 1, as would be expected. The rates at Detector 1 were rather uniform throughout the month; Corun vacuum cleans the recess in which these detectors are located anytime their background levels seem to be

rising. During 6 days, beginning with the 19th, the maximum rates occurred at the hand level. Detectors 3 and 5, just above and below the hand level, were elevated to a lesser extent on these dates as well. The background at Detectors 3, 4 and 5 returned to normal on the 27th. Corun could not recall any event that might account for this anomaly. There is no reason for concern. When the HECM background level increases at a detector for any reason the counting time is automatically increased to provide the required degree of sensitivity to contamination.

That is why it is unnecessary to require a minimum counting time for this instrument. The minimum counting time imposed for it causes unnecessary work anytime the background is unusually low. When the background is low the HECM can achieve the same sensitivity in less counting time, so it automatically decreases that time. But the time can go below the minimum counting time artificially set by Neutron's regulators to be 30 seconds. When that happens it is necessary to reset the computer program and count again. The only way to increase the counting time above the 30 second minimum is to temporarily select a higher sensitivity level. Nothing is accomplished by the extra work; it is only done because the background goes down.

4.0 Survey Forms

While reviewing the HP Monthly Checklist file I noticed that most of them include a level (radiation, contamination, concentration, etc.) which, if exceeded, must be promptly reported by the technician to the RSO. Such "trigger" levels are very important. Without them some technicians fail to attach enough importance to what might be a serious occurrence requiring immediate management attention. *I recommend including an RSO notification trigger level on all such forms.*

5.0 Monthly Type V Radiation Surveys

These surveys are usually performed using an E-600 instrument. The technician marks the dose rates measured at various periphery locations on a survey map for the facility. I reviewed the maps for January through November, 1999, looking primarily for the maximum dose rate entries. In general, the highest levels found appeared to be in the direction of the house belonging to the member of the public who receive the highest dose last year. The levels measured on a line from the house to the radioactive waste storage rooms seemed to be a little higher than those to the right or left. It occurred to me that relocation of certain B-25 shields might be indicated.

I attempted to verify my observation using a Bicon urem meter calibrated 11/17/99. To the right and left of the courtyard gate are large concrete slabs which provide considerable shielding. Therefore it was only necessary to take measurements along the length of the gate. Facing the waste rooms, I found a point near the right end of the gate opening at which the dose rate was ~200 μ R/h, less to the right because of the concrete slab, and less to the left, *possibly* due to less shielding of the waste-room contents. This point did seem to be on the line from the house to the radioactive waste storage rooms.

During December the contents of these rooms were reorganized, and considerable interior shielding was added. Jeff Williams has informed me by telephone that dose rates both on and off site were reduced. It will be interesting to find out whether the high point I think I identified is no longer a peak.

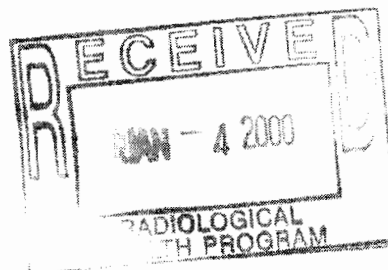
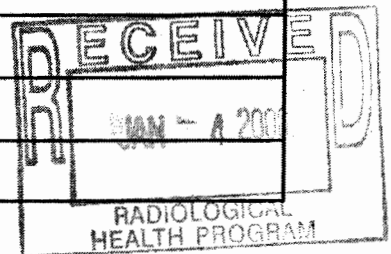


TABLE I. HECM BACKGROUND

Oct. '99 Date	Maximum Rate Among Detectors	
	Feet (Detector 1)	Hands (Detector 4)
1	142	
4	142	
5	147	
6	143	
7	142	
8	144	
11	141	
12	143	
13	144	
14	141	
15	143	
18	144	
19		159*
20		159*
21		159*
22	(143)	159*
25	(147)	160*
26	(147)	159*
27	147	
28	144	
29	149	
1	143	

* Detectors 3 and 5, just above and below the hand level, were elevated to a lesser extent.



MDE

MARYLAND DEPARTMENT OF THE ENVIRONMENT

2500 Broening Highway • Baltimore Maryland 21224
(410) 631-3000 • 1-800-633-6101 • <http://www.mde.state.md.us>

Parris N. Glendening
Governor

Jane T. Nishida
Secretary

SEP 24 1999

Jackson A. Ransohoff, President
Neutron Products, Inc.
22301 Mt. Ephraim Road
P.O. Box 68
Dickerson, MD 20842

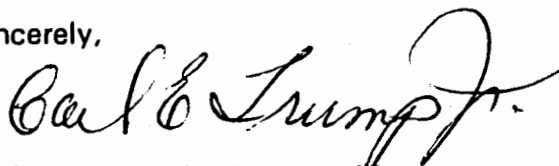
Dear Mr. Ransohoff:

This letter is in response to Mr. W.L. Ransohoff's August 13, 1999 letter that describes Neutron Products Incorporated's (NPI) intent to store soil contaminated with cobalt-60 in areas outside of the Limited Access Area (LAA). The Radiological Health Program has carefully reviewed your intended storage methods and determined that it would be in violation of License Condition 21.B (1) of your Maryland Radioactive Materials License.

Since this soil is contaminated with cobalt-60, licensed radioactive material, the RHP considers it to be radioactive waste. License Condition 21.B (1) states, in part, that any radioactive waste shall only be stored in the LAA. License Condition 21 further states that this type of radioactive waste may not be stored for more than two years and copies of the radioactive waste shipment records shall be provided to the RHP and the Hazardous and Solid Waste Administration within 14 days of the shipment dates. Finally, License Condition 21.B requires NPI to submit a comprehensive plan for the disposal of all low - level radioactive waste within 90 days of the issuance of the license.

If you have any questions concerning this letter, please contact Messrs. Alan Jacobson, Ray Manley or me at 410-631-3301. You may also reach my office toll free by dialing 1-800-633-6101 and requesting extension 3301.

Sincerely,



Carl E. Trump, Jr., Program Manager
Radioactive Materials Licensing and
Compliance Division

RGF/CET/ADJ/edjg

** Transmit Conf. Report **

Sep 27 '99 14:43

MDE-RHP	---> 913013495007
No.	0012
Mode	NORMAL
Time	1'30"
Pages	1 Page(s)
Result	T.4.1

MARYLAND DEPARTMENT OF THE ENVIRONMENT
Air & Radiation Management Administration
Radiological Health Program

Facsimile Transmittal Sheet

TO: Bill Ranschoff
NPI

FROM: Cdeuna

MDE-ARMA-Radiological Health Program
2500 Broening Highway ♦ Baltimore MD 21224
410-631-3300 [phone] ♦ 410-631-3198 [fax]
or 1-800-633-6101 (in Maryland only)

DATE: 9/27/99

OF PAGES (including this sheet): 2

COMMENTS: Original is in the mail



MDE

MARYLAND DEPARTMENT OF THE ENVIRONMENT

2500 Broening Highway • Baltimore Maryland 21224
(410) 631-3000 • 1-800-633-6101 • <http://www.mde.state.md.us>

Chris N. Glendening
Governor

AUG 24 1999

Jane T. Nishida
Secretary

Jackson A. Ransohoff, President
Neutron Products, Inc.
22301 Mount Ephraim Road
P.O. Box 68
Dickerson Maryland 20842

RE: Response to your July 26, 1999 letter

Dear Mr. Ransohoff:

Enclosed please find copies of the information you requested with regard to the assessed Administrative penalty of \$15,700. The information has been assembled with the intent to clarify matters.

Maryland Law requires the Department to charge xeroxing fees for the material at .22 per copy (112 copies). An invoice in the amount of \$24.64 will follow.

I hope this information will be helpful to you. If you have any further questions, you can contact Alan Jacobson or me at (410) 631-3300 or toll free 1-(800) 633-6101 and requesting extension 3300.

Sincerely,

Carl E. Trump, Jr., Program Manager
Radioactive Materials Licensing and
Compliance Division

CET/cc

Enclosure(s): Copies of FOIA Information Request

MDE

MARYLAND DEPARTMENT OF THE ENVIRONMENT
2500 Broening Highway • Baltimore Maryland 21201
(410) 631-3300 • 1-800-633-6101 • <http://www.mde.state.md.us>

Parris N. Glendening
Governor

AUG 24 1999

CERTIFIED MAIL: RETURN RECEIPT REQUESTED

Jackson A. Ransohoff, President
Neutron Products, Inc.
22301 Mt. Ephraim Road, P.O. Box 68
Dickerson Maryland 20842

RE: NOTICE OF CIVIL PENALTY SETTLEMENT
[RAM-99-02]
Radioactive Materials License Number:
#MD-31-025-01

Dear Mr. Ransohoff:

This letter serves as a reminder that a \$5,000.00 civil penalty settlement payment is due to the Maryland Department of the Environment (MDE) by September 1, 1999 as a result of the decision rendered by the Montgomery County, Maryland Circuit Court's "Stipulation and Settlement"-Civil No. 76639. In addition, an interest amount of \$300.00 is assessed based on the balance of \$5,000.00. The total amount due is \$5,300.00 upon receipt of this notice. Please make your check (invoice enclosed) payable to: Radiation Control Fund and mail to:

Maryland Department of the Environment
Radiation Control Fund
P.O. Box 2198
Baltimore, Maryland 21203-2198

Should there be any questions in this matter, please contact Mr. Carl E. Trump, Jr., or me at (410) 631-3300. You may also reach our office by dialing 1-800-631-6101 and requesting extension 3300.

Sincerely,

Roland G. Fletcher

Roland G. Fletcher, Manager
Radiological Health Program

CET
RGF/CET/cc

Enclosure: Invoice

cc: Attorney General's Office
Debbie Kemp
Reader File
Merrylin Zaw-Mon

7 402 151 303

US Postal Service
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PS Form 3800, April 1995

10/29/99 CBT

NEUTRON PRODUCTS inc

22301 Mt. Ephraim Road, P. O. Box 68
Dickerson, Maryland 20842 USA
301-349-5001 FAX: 301-349-5007
e-mail: neutronprod@erols.com

October 21, 1999

Mr. Roland G. Fletcher, Program Manager
Radiological Health Program
Maryland Department of the Environment
2500 Broening Highway
Baltimore, Maryland 21224

VIA FAX: 410/631-3198

Re: License MD-31-025-01

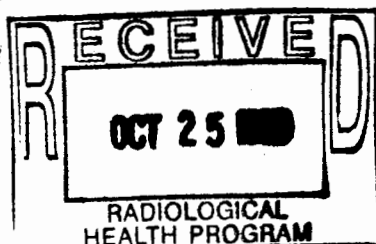
Request for Source Transfer from Columbia Memorial dated August 20, 1999
Request for Source Transfer from University Hospital dated August 20, 1999
Request for Source Transfer from Baptist Memorial Hospital dated August 31, 1999
Request for Source Transfers from St. Luke's Medical Centers dated September 21, 1999
Request for Source Transfer from United Hospital Center dated September 23, 1999

Dear Mr. Fletcher:

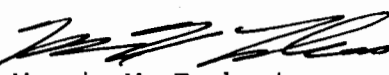
Per your request during our telephone conversation of yesterday afternoon, this is to advise that:

- Neutron is planning to remove the teletherapy units from the listed facilities;
- all of the units, except the one at Baptist Memorial Hospital, contain depleted uranium;
- none of the source holders should contain depleted uranium;
- Neutron is planning to transfer the depleted uranium in the units to our NRC license and is not planning to bring the units or the depleted uranium to Neutron's Dickerson facility; and,
- in no event will the license limit for depleted uranium at Dickerson be exceeded.

If you have any further questions, please call me. If there are no questions, we look forward to promptly receiving approval to transfer the sources per the above requests.



Sincerely,
NEUTRON PRODUCTS, INC.


Marvin M. Turkanis
Vice President

MMT/afc

REM 8/9/99

NEUTRON PRODUCTS INC

22301 Mt. Ephraim Road, P. O. Box 66
Dickerson, Maryland 20842 USA
301-349-5001 FAX: 301-349-2433

5 August 1999

VIA FAX: 410.631.3198

Mr. Roland G. Fletcher
Environmental Manager
Radiological Health Program
Maryland Department of the Environment
2500 Broening Highway
Baltimore, Maryland 21224

Re: Radioactive Material License Number #MD-31-025-01

Dear Mr. Fletcher:

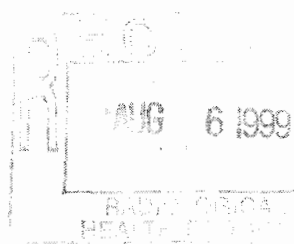
I am writing in timely response to the Notice of Violation dated July 14, 1999 and received here on July 16. This letter contains our responses to the violations alleged therein. Our responses to the concerns and programmatic issues raised are set forth in a separate letter dated August 6 to avoid confusion in referencing.

Citation #1 states:

- "1. Section D.501 titled "Surveys and Monitoring-General" requires in part that each licensee shall conduct surveys that are necessary to evaluate radiation levels and concentrations of radioactive material. License amendment 33, Item N dated May 23, 1989 requires in part that all soils exhibiting levels of radioactivity in excess of 8 picocuries per gram above background, for an equivalent area of 30 ft by 30 ft, wherever found, shall be removed and properly stored/disposed of by the licensee. The gamma exposure rate at one meter above the ground surface shall not exceed 10 microR/hr above background for an area greater than 30 ft by 30 ft and shall not exceed 20 microR/hr above background for any discrete area.

"Contrary to the requirements of Section D. 501 and license amendment 33, the analysis of soil samples collected by RHP Inspectors from the dry pond and the adjacent railroad property collected on March 18 and 19, 1999 indicate that the soil concentration for cobalt-60 contamination exceeded 8.0 picocuries per gram. These contaminated areas of the dry pond and the adjacent properties are greater than 30 ft by 30 ft. The licensee failed to conduct soil samples and analysis to accurately determine the status of compliance during the years of 1997 and 1998. During the inspection, RHP Inspectors collected random soil samples from the far side of the dry pond and the adjacent railroad property. The samples were analyzed by the Maryland Laboratory Administration's Radiation Chemistry Laboratory who determined the cobalt-60 soil concentrations to be 186.6 and 101.4 picocuries per gram respectively. The licensee still has not removed soil contaminated with cobalt-60 from the adjacent railroad property to establish compliance with the 8.0

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picoCurie per gram soil concentration limit. The Stipulation and Settlement (Civil Case No. 76639 in the Circuit Court for Montgomery County) dated January 3, 1994 required the licensee to clean all contaminated soil areas by June 15, 1994. The licensee failed to meet this deadline and is refusing to remediate this property. Furthermore, the dose rate at one meter above the ground surfaces of the dry pond and adjacent areas exceeds the dose rate limit of 10 micro R/hr above background. The RHP has determined the dose rate at two locations at the boundary of the dry pond to be approximately 631 millirem per year and 342 millirem per year. The fence surrounding the dry pond was constructed such that it does not prevent or adequately discourage unauthorized access. During the April 1997 inspection, the RHP inspectors found evidence that soil contaminated with cobalt-60 was removed by an unknown person other than the licensee. The licensee did not submit the design to the RHP for approval prior to construction and this issue still remains unresolved. This is a **REPEAT** and ongoing violation."

Response

1.1 It is no secret that we do not meet the requirements of License Condition 13N of Amendment 33. Prior to its imposition in 1989, we informed MDE that we would not be able to comply with this condition until after the courtyard had been enclosed; and the program we submitted in response was not in strict conformance with MDE's request. However, rather than resolve our differences at the time, MDE chose to characterize our response as being in substantial compliance, and contracted to cooperate with us to resolve any perceived deficiencies. Unfortunately, your concept of cooperation includes neither quantitative analyses nor any other consideration of technical feasibility or economic practicality; and as a result, our license has been burdened by harmfully stringent and remarkably counter-productive license conditions for more than a decade.

1.2 Nevertheless, during the intervening period, we have devised and implemented means other than Courtyard Enclosure which have enabled us to approach, but not nearly achieve, the impractical standard prescribed by License Condition 13N, and we have realized appreciable success in that regard. To wit:

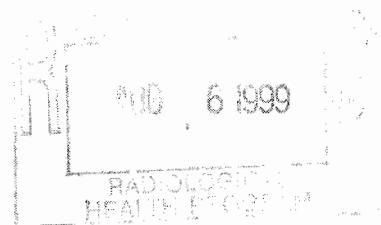
we conceived, constructed, and put into operation a stone trap that reduced by about 80% the activity reaching our dry pond, thereby reducing both activity and radiation levels within the dry pond and downstream thereof;

although it is not practical to preclude forced entry to the dry pond by the mischievous members of our society, we built and posted an enclosing fence that is more than sufficient to deny inadvertent access to the innocent but unwary;

we undertook several successful campaigns to remove and package contaminated soil and stone from the stone trap, the dry pond itself, and the outflow region immediately downstream thereof, removing and evaluating tons of soil and stone on each such occasion, substantially reducing both radiation levels and soil contamination thereby, and establishing that we were successfully recovering all

NEUTRON PRODUCTS inc

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but a fractional percent of the activity carried by stormwater entering the system;
and

we performed a major cleanup and reorganization of the south waste room, thereby substantially reducing skyshine from the storage of RadWaste that MDE would not authorize us to compact.

As a consequence of the measures implemented above, a current survey shows the waste-high radiation level on the siding had been reduced to approximately 70 uRem/hr, a reduction of 60% from the level of 170 uRem/hour measured at the same location in 1991. However, rather than acknowledge and cooperate with our good faith efforts to do what we reasonably could to further reduce a level of contamination, already far below regulatory limits and of no conceivable concern to public health and safety, MDE ignored our progress, cited us for failing to satisfy the impractical limits of License Condition 13N during virtually every inspection of our O1 license, and sought to impose grossly inordinate financial penalties for failing to achieve the impractical result it had mistakenly required.

1.3 As you know, rather than pay the inordinate fine (of \$120,000) you sought to levy in 1990, we proposed to spend at least three times that amount on mutually agreeable radiation safety projects - including the enclosure of our Courtyard and the construction of Radwaste management facilities therein which were reasonably required to satisfy the requirements of Extra Regulatory License Conditions 13L and 13N. Yet you rejected that constructive approach, for stated reasons that were unintelligible, in favor of a lawsuit which required us to spend on legal fees the funds we were prepared to devote to the satisfaction of your unsubstantiated and then unattainable requirements. Even at this late date, it would seem that a written explanation is required.

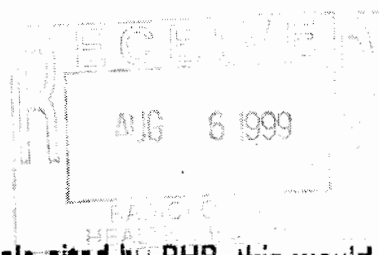
Moreover, MDE has also chosen to misrepresent the essential features of the Stipulation and Settlement dated January 3, 1994 which purportedly settled that suit. At the settlement meeting, I explained that it would be counterproductive to remove soil from the siding because it presently serves as an effective barrier to the spread of activity (however low and innocuous) into areas more likely to be occupied. As a result, it was agreed in writing that we would not remediate the siding, or satisfy the limits of Condition 13N as it pertains to our own property, until two months after the Courtyard enclosure was complete, and the written Agreement provides that we will not be penalized for failing to do so. Moreover, it was orally agreed that, even after the courtyard is enclosed, the extent of downstream and dry pond cleaning would be governed by considerations of ALARA.

1.4 Indeed, that understanding has served both Neutron and the community well since the activity on the siding is contained within a distance of about fifty feet. Yet we continue to be cited for failing to undertake what was agreed at the time to be a counterproductive and expensive exercise of no material benefit to the community.

1.5 Putting all this in perspective, a member of the public would need to ingest 5,000,000 picocuries in order to be exposed to a committed effective lifetime dose

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equivalent of 50 millirem. At the average contamination levels cited by RHP, this would amount to ingesting more than a hundred pounds of contaminated soil. Even if such an unlikely event were to occur, the cobalt-60 present in the soil would pose only a minimal hypothetical risk compared with the suicidal risks associated with eating so much dirt and stone, whether contaminated or not. Thus it is clear that there is no credible risk to the public from ingestion of the contaminated soil at issue here.

1.6 Moreover, as noted by NRC more than five years ago in response to an MDE query, regulatory limits on permissible soil contamination levels are governed by the radiation exposure likely to be experienced by real people. It is mind boggling to us that, after all these years, no one within RHP has performed the analyses required to either verify or contradict Neutron's analysis, long shared with MDE, that the levels of cobalt-60 contamination in and around the dry pond are not likely to result in exposures to individuals in excess of 2 mRem per year, and do not constitute either a public health hazard or a violation of any duly promulgated regulation or license condition.

1.7 Finally, it should be obvious, after multiple soil removal campaigns, that no reasonable level of soil removal and remediation at this time, or any intervening time, will provide for ongoing compliance with Condition 13N. Rather, until such time as the courtyard is enclosed, it is unlikely that literal compliance with Condition 13N, as interpreted by MDE, could be achieved, if at all, without the continuing and totally unwarranted expenditure of tens (perhaps hundreds) of thousands of dollars per year and several man weeks of tedious work. I submit that few, if any, responsible regulators would fail to consider any such expenditure to be a misdirection of priorities and a proposed squandering of limited material and human resources much better applied to projects far more likely to benefit radiation safety, public health and environmental decency.

1.8 Your comments about the fence are not well taken. Clearly, the purpose of the fence surrounding the dry pond is to discourage inadvertent entry by members of the public, and for that purpose, the existing fence is more than adequate. Moreover, no fence of the type prescribed by both MDE and Neutron is high enough to keep out someone who wants to get in; and in the course of the April, 1997 inspection to which you refer, I am told it was evident that "the soil contaminated with cobalt-60 that was removed by an unknown person other than the licensee" was, in fact, removed by digging under the fence not by climbing over it.

Corrective Action

1.9 On Neutron's part, Dick Demory, Jeffrey Williams and Bill Ransohoff will continue to work on alternative means for reducing the amount of contamination which reaches the dry pond and the rail siding. Specifically:

Recently performed laboratory tests have demonstrated the effectiveness of clinoptilolite, which is a naturally occurring zeolite rock, at removing cobalt-60 contamination from water; and some clinoptilolite gravel has been deployed in the

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stone trap and dry pond in order to test its effectiveness in the field;

We have taken additional measures within the LAA itself (see Response to Citation #3) which we believe will be at least partially effective in further reducing the outflow of activity from the courtyard; and

For the reasons set forth in paragraph 1.10, we are planning to restore the original dry pond channel to its original contour.

1.10 Our most recent surveys of the dry pond and its environs indicate that the cobalt-60 concentration in the area downstream of the rip-rap on the discharge side of the dry pond (and proximate to the dosimeter location which MDE claims to have exceeded 500 millirem) has increased relative to other locations upstream. In hindsight, it appears that our multiple remediation campaigns have lowered the contour of the dry pond channel and reduced somewhat the efficiency for capture within the dry pond itself. It is timely for another drypond remediation campaign, in the course of which we plan to remove contaminated soil in the effected area on both sides of the fence and from the dry pond channel, after which we will restore the original contour of the dry pond channel. Pending results from the clinoptilolite trial, we may also deploy more of this material at the pond entrance in attempt to further reduce the downstream migration of activity. We are awaiting a dry pond inspection report from the county and plan to make any other required dry pond changes concurrently. In any event, we expect another interim removal of contaminated soil to be completed during the next few months under the supervision of Jeffrey Williams.

1.11 These are the types of corrective actions which we have used over the years to reduce the dose rates on the abandoned rail siding as described in Paragraph 1.1 above; and although their continuation is not necessary from considerations of public health, it has been and remains a prudent course of action for its prospective positive impact on public relations. We respectfully submit that the realization of a positive impact is thwarted, not by Neutron's failure to perform as reasonably required by the facts, but by MDE's ill considered refusal to admit that the Dunningham limits of License Condition 13N were imposed in error and improperly enforced, and the needless anxiety created among some of our neighbors as a result is a disservice to the community. In the course of our forthcoming Management Conference, we would appreciate an opportunity to discuss and consider a meaningful remedy.

1.12 Regarding surveys and monitoring, the perimeter of the drypond and the adjacent area downstream thereof have been continually monitored with thermoluminescent dosimetry throughout the period in question and it has been no secret that these areas do not meet the Extra Regulatory requirements of Condition 13N. In addition, three documented surveys were conducted in 1999, at least one of which was reviewed by RHP's inspector. While the data do not (and for reasons stated above should need not) demonstrate compliance with Condition 13N, when viewed in historical context it does show a marked reduction in activity from levels present in 1991 which were, in turn, much

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lower than those of 1989. Again, rather than continue to berate us on this matter, it would seem more constructive for MDF to acknowledge the genuine progress that has been made, take its fair share of the credit, and repeal its incessant demand for counter-productive action on our part.

II. Citation #2 states:

"2. Section D.101, titled "Radiation Protection Programs" requires in part that each licensee shall use all means necessary to maintain radiation exposures to levels as low as reasonably achievable.

Contrary to Section D.101, the licensee failed to maintain radiation exposures to members of the public living near the plant to levels as low as reasonably achievable (ALARA). This is a REPEAT violation from previous inspection. The RHP measured approximately 202 millirem per year at the portico of a resident's home, 353 millirem per year on the lawn of a nearby resident and 150 millirem per year next to the home located on this property. The RHP has identified the waste storage rooms as the source of these elevated radiation levels in the community. NPI continues to store quantities of radioactive waste. In fact, the licensee has only shipped for disposal, a small fraction of the radioactive waste that they have generated over the past three decades."

Response

II.1 First, it is relevant to note that the principal source of radiation in the neighborhood is from skyshine that is very low in energy and substantially shielded against by the ordinary walls and roofs of area dwellings. Thus, outdoor readings are not indicative of actual exposures. The person at highest risk of exposure is an individual who occupies the house across the street, and spends the great majority of his time indoors. Thus, we have been monitoring the inside of his home for several years. For 1998, our records indicate that he received a dose of 76 millirem based on TLD data and using conservative assumptions. The dosimetry data for 1998 was reviewed by RHP inspectors.

The 1998 exposure was essentially unchanged from that of 1997, but when compared to 1996 data, applying the same conservative assumptions, his exposure has been reduced by about 18 percent. The reduction resulted from a combination of shielding the direct component from the north waste room; the bagged waste sorting and shipping campaign of 1996; and the reorganization of the south waste room. While reduction of public exposure was not the sole objective of the south waste room project, the reduction in skyshine which resulted came at the expense of 6.9 person-rem of occupational exposure to Neutron employees.

II.2 Moreover, with regard to ALARA, we are not aware of any additional measures which could be taken at this time that would reduce the dose to the most highly exposed members of the public that would not require offsetting occupational exposure two to three orders of magnitude greater. If RHP knows of some economically viable measures we

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might undertake, pending the completion of the Courtyard Enclosure Project, which could reduce radiation background in the community without significant increases in occupational exposure it is timely for you to share them with us. This is our second request. Alternatively, if it is the official position of RHP and/or MDE that it is ALARA to effect a small decrease to public exposure at the expense of a much larger increase in exposure to workers, then kindly document the basis of that position. Meanwhile, based on the guidelines provided in NUREG 1530, in performing ALARA analyses the value of \$2,000 is to be placed on each person-rem of exposure. Accordingly, if we can reduce our neighbor's exposure to zero for less than \$152 per year ($\$2,000/\text{person-rem} \times 0.076 \text{ rem/year}$), we are obliged to so perform. We are not aware of any action we could take for any reasonable sum of money (not limited to \$152) that would reduce his exposure by any measurable amount. If MDE knows of any such opportunity, please advise and we will consider it.

II.3 In any event, as opportunities to reduce public exposures arise in conjunction with some other project so that they can be accomplished without undue increases in occupational exposure, we will pursue them as we always have (see paragraphs II.4 and II.5). In reality, it is our experience that we routinely spend significantly in excess of ALARA-recommended amounts in trying to reduce exposures to both employees and neighbors, and MDE's allegations in this regard are ill considered in the extreme. Our current effort involves the planned reorganization of the North Waste Room intended primarily for other purposes. The plans for this reorganization are well advanced, we are continuing to make the necessary preparations, and we intend to complete the process within the next few months. As a by-product, background radiation in the neighborhood will also be reduced in a way that could not begin to be justified (for that sole purpose) by considerations of ALARA.

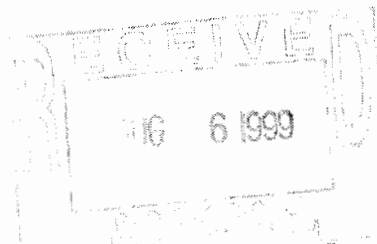
II.4 A major source of contention between MDE and Neutron is MDE's insistence that ALARA means "as low as possible" and that ALARA analyses can never be used to justify inaction on the part of the licensee. It is our position that, in its interpretation of ALARA, MDE has strayed very far afield from both NRC's documented intent and from the common sense reading of MDE's regulations in that regard; and we consider it critical to resolve the matter. For that purpose, we suggest that both competent NRC authorities on the matter and MDE top management be present at our Management Conference.

II.5 In addition, the effect of our stored radwaste on background levels of radiation could be significantly reduced by the prudent use of a compactor. As you know, we have been prohibited from compacting waste for more than a decade. We spent approximately four years trying to secure MDE's approval for a redesigned compactor which met all of MDE's requirements. However, ultimately MDE indicated that it had no intention of approving a unit of our own design and construction and that we should have proposed a system manufactured by others and used elsewhere in the industry.

II.6 While we take exception to that policy, we have identified such a unit, placed a deposit on it, and submitted a proposal to MDE for a license amendment that would authorize its installation and use. This is a compactor and air handling system which has

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been used extensively throughout the industry for the compaction of radwaste. For this project to be completed, the next step is for MDE to grant approval for the installation and use of the proposed compactor.

II.7 Furthermore, use of the compactor will be required to make most efficient use of our radwaste shipments. For instance, an 8 drum shipment of uncompacted waste will only remove 8 drums from our facility. With the use of a compactor, we can reasonably expect to remove 20 to 40 drums in such a shipment.

II.8 MDE's allegation that Neutron "has shipped for disposal, a small fraction of the radioactive waste they have generated over the past three decades" is both false and maliciously misleading. The relevant facts, in proper context, are that in a manner consistent with the clearly stated intent of The Atomic Energy Act of 1954 As Amended ("The Act"), and the proper application of ALARA, the prudent management of the Radwaste generated by Neutron comprises:

the encapsulation and underwater storage of the highest activity waste pending its decay to the point where it can be stored in above-grade shielded storage, or disposed of as radwaste significantly reduced in activity;

the storage of other high activity radwaste which does not lend itself to encapsulation in above-grade shielded storage which may include drum shields, waste storage vaults, shielded waste storage rooms, etc.;

the accumulation, packaging and unshielded (or lightly shielded) storage of low activity waste, and

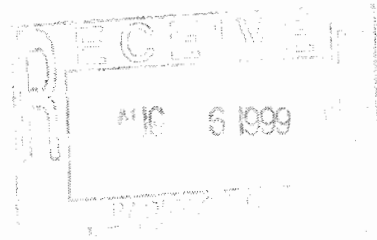
the handling of waste for shipment at such time as it has decayed to the point where the radiation safety benefits of disposal exceed the cost (in occupational exposures and monetary costs) in a way that is truly responsive to ALARA and the stated intent of The Act.

II.9 As a result, the great majority of the radwaste curies generated by Neutron, are encapsulated in stainless steel, stored for extended periods, and disposed of by decay rather than offsite shipment. Similarly, more of the curies stored in drum shields are properly disposed of by decay than by premature shipment for disposal. However, prior to 1990, the great majority of radwaste volume was compacted, packaged and disposed of within a few months (or years) of its generation. Our then traditional approach to Radwaste was altered in response to two unrelated events:

the failure of the waste disposal site at Maxey Flats, KY, followed by lawsuits against those of us who sent waste there in good faith; and

orders from the State restricting our shipment of Radwaste, and requiring us to submit plans to store all radwaste generated by Neutron for five years.

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The Maxey Flats episode raised a stern warning that the shipment of radwaste to an approved "disposal" site did not really constitute disposal. Rather, it may well constitute an act of putting one's waste into less reliable hands at great expense while retaining liability.

The State's initiative brought forth from Neutron a totally constructive response that was trashed by the Department for stated "reasons" that obviously lacked validity. In any event, we were being required to make a major investment in Radwaste storage, and in view of all the circumstances, it seemed irresponsible to spend the funds that would be required to safely store our waste in order to ship, prematurely, the only certain demand we had for the storage capacity we were being Ordered to create under what proved to be false pretenses. Meanwhile, we became intrigued with both the economic and radiation safety advantages of extended term storage for high activity Radwaste.

In any event, the great majority of our waste volume has been and is, of low activity; and under the competitive market conditions that are ordained by The Act, Neutron would not choose to store the great majority of its waste volume for a period longer than reasonably required to accumulate optimum shipments; and that is precisely what we did prior to 1990. Thus, there is no truth to MDE's twin myths:

that we have only shipped a minor portion of the total waste we have generated;
or

that we have a desire to store any waste (high or low activity) for periods longer than those which are economically necessary and/or ALARA optimum.

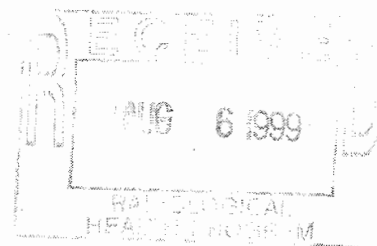
Corrective Action

11.9 The fact that MDE has cited us in alleged Violation #9 for a violation of ALARA indicates that some sort of ALARA analysis was performed by MDE which would support that citation. Please forward that analysis to us promptly so that we can evaluate that part of the citation on its merits. Alternatively, please inform us of the flaw(s) in our assessment that we are in wide margin compliance with ALARA except to the extent that we incur unnecessary exposures in attempting to mollify MDE by performing to its wishes on matters that may be adverse to ALARA but are not too difficult to oblige.

11.10 The planned reorganization of the North Waste Room is being undertaken to fulfill several necessary objectives unrelated to public exposure. However, we have identified an opportunity to decrease the skyshine emanating from waste storage in the process. We have completed our planning and are currently fabricating shadow shielding to be used in this project and will proceed once the shields are completed. The actual reorganization will be performed under the overall supervision of Jaffroy Williams, and we intend to schedule it at our earliest opportunity and complete it by the end of the summer.

11.11 Similarly, the installation and operation of a drummed waste compactor fulfills many

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desirable objectives including: waste volume reduction (which MDE elsewhere supports), the reduction, if not elimination, of combustible packaging, and a decrease in effective disposal costs. In addition, the compaction of existing waste in storage will allow us better use existing means to shield waste in storage and thereby further decrease skyshine. The installation of the compactor will be performed under the supervision of Jeff Corun and Dick Demory, but no further progress on this project can be made until the approval of its installation and use from MDE is secured. We know of no reason why such an approval cannot be quickly granted. Similar systems have been used extensively throughout the industry and it is clearly in the interest of Neutron, MDE and the community to complete acquisition, installation and startup with minimum delay.

In summary, Citation #2 seems to be based primarily on misinformation and erroneous assumptions and analyses; and we respectfully suggest that it be withdrawn.

III. Citation #3 states:

"Section D.501, titled, "Surveys and Monitoring-General" requires in part that each licensee make or cause to be made surveys as may be necessary to evaluate the extent of the radiation hazards that may be present and to establish compliance with these regulations.

Contrary to Section D.501, the licensee failed to conduct radiological surveys in the courtyard area of the LAA sufficient to determine the presence of leaf debris, which contained elevated levels of cobalt-60. RHP inspectors collected a sample of this debris, which contained a cobalt-60 concentration of approximately 7704.8 picocuries per gram. The RHP has long identified this area as a potential release point where radioactive materials exit the plant in an uncontrolled manner."

Response

III.1 We have undertaken an extensive courtyard cleaning and remediation effort. Several years ago, we identified several spots of fixed contamination embedded in the courtyard (primarily in joints in the concrete). Those which could be easily dislodged without extensive damage to the courtyard and without risk of their dispersal were removed. The remainder were painted to fix them in place and to hinder their dissolution by rainwater.

III.2 Those spots have now been forcibly removed, the impacted concrete joints have been filled with grout, and most of the concrete portion of the courtyard has been seal-coated to reduce accessibility for the deposition of additional contamination.

III.3 Moreover, most of the courtyard has been thoroughly cleaned, with the remainder to be done after the completion of the north waste room reorganization briefly described in our response to Citation #2 above.

III.4 Equally important, we have worked to reduce the likelihood of contamination

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entering the courtyard. The floors of the room behind the cell, the ante-room and the shop have all been cleaned and repainted so that they will be easier to decontaminate. The application of this paint should not significantly hamper whatever decommissioning activities are reasonably required in the future.

III.5 In addition, the door between the room behind the cell and the open courtyard has been sealed more permanently and more effectively than before.

III.6 Our health physics technician had previously been instructed to periodically remove and package leaves collecting in the courtyard and for the most part our observations were that he had done so. However, we overlooked the small amounts of humic material which deposited in the courtyard's nooks and crannies. This material contains many carboxylic sites capable of ionically bonding cobalt that would otherwise have been fixed by the stone trap or drypond. It was this humus which was sampled by RHP's inspector, and we are expanding our courtyard policing practices to include the recovery of such material.

III.7 We understand and acknowledge the Department's concern about contaminated dirt and leaves in the courtyard being a potential source for off-site contamination. However, our survey program has been finding fewer and fewer particles of lesser and lesser activity over the years, and we believe this to be an indication of overall improvement in our contamination control program. We also understand that the Department does not believe our survey program to be adequate, and that issue is addressed in our response to citation #9.

Corrective Action

III.8 Danny Wineholt has been made responsible for ensuring that the courtyard remain free of significant quantities of leaves and other debris which may adsorb cobalt-60, and a procedure has been drafted for his training and use.

III.9 Your repeated references to "the release of radioactive materials in an uncontrolled manner" is neither well considered nor well taken. The salient facts are:

that we release to the environment less than one millicurie for each megacurie of cobalt-60 processed, or less than one part per billion;

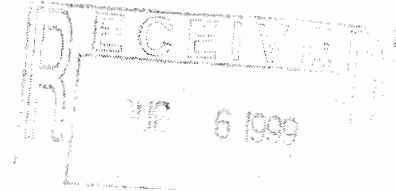
that said releases are harmless to persons and property, are periodically recovered, and are in wide margin compliance with duly promulgated regulations related thereto; and

it is long past time that you terminated your irresponsible rhetoric in that regard.

IV. Citation #4 states:

"Section D.101, titled "Radiation Protection Programs" requires in part that each licensee shall use all means to maintain radiation releases of radioactive material to

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levels as low as reasonably achievable.

Contrary to Section D.101, the licensee failed to use all means necessary to control releases of radioactive material from the Limited Access Area (LAA) to levels as low as reasonably achievable (ALARA). Cobalt-60 contamination continues to be found outside of NPI's boundary thus substantiating the loss of control of a hazardous radionuclide. Two soil samples that inspectors collected from the unrestricted side of the LAA fence contained cobalt-60 soil concentrations measured to be 167.7 and 103.5 picocuries per gram. Soil samples that were collected by the railroad tracks near the road and adjacent to the fence on the outside of the drypond measured 86.3 and 21.7 picocuries per gram respectively. The soils in the dry pond and adjacent railroad property contain concentrations of cobalt-60 that exceed regulatory requirements. This is a REPEAT and ongoing violation."

Response

IV.1 On January 4, 1994, in response to an MDE query regarding the viability of the 8 picocurie per gram limit imposed upon our licensee, NRC headquarters advised that the important consideration is the level of exposure members of the public are likely to receive as a result of that contamination. Not having received the answer it sought, MDE simply ignored the guidance.

IV.2 Moreover, we estimate that no individual, except those Neutron employees who periodically clean the dry pond, receives more than 2 millirem per year from the cobalt-60 contamination on and around our property, vis-a-vis a regulatory limit of 100 mRem per year. In addition, we know of no model which credibly projects that the cumulative exposure to all members of the public *from such contamination* would exceed 5 millirem per year.

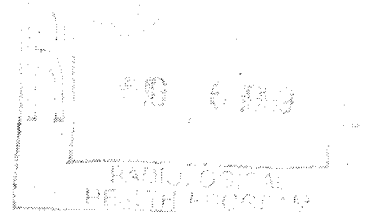
IV.3 So, again using the \$2,000 per person-rem value recommended for ALARA analyses in NUREG 1530, we find that if actions on our part costing less than \$10 per year (\$2,000/person-rem x 0.005 rem/year) could entirely eliminate the cumulative exposure from soil-deposited contamination, then those actions should be performed.

IV.4 Clearly, we spend significantly in excess of \$10 per year in our efforts to reduce the presence of soil-deposited contamination and the citation that we are not in compliance with ALARA in this regard is, therefore, clearly without merit.

Corrective Action

IV.5 As in Citation #2, the fact that MDE has cited us for a violation of ALARA indicates that some sort of ALARA analysis has been performed by MDE which would support that citation. Please forward that analysis to us so that we can evaluate it on its merits. Alternatively, please inform us of the flaw(s) in our assessment that we are in wide margin compliance with ALARA. Otherwise, kindly rescind this citation.

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VI.4 Again, our performance during this period constitutes evidence of sound contamination control, and a true performance-based inspection would recognize that, although some i's were left undotted and some t's uncrossed, the intended purpose of the floor surveys (to verify that the building outside of the LAA remained contamination-free) was not compromised. Therefore, no citation should have been issued, and we respectfully request that Citation 6 be reconsidered and rescinded.

VII. Citation # 7 states:

"Section D.1103 titled, "Records of Surveys" requires in part that each licensee shall maintain records of the results of radiation surveys required to demonstrate compliance with regulatory limits and item D.8 of license amendment 33:

Contrary to Section C.31 and D.1103, records of the floor monitoring surveys, which were conducted during the months of March-July, 1998, were not maintained or available for inspection."

Response

VII.1 The former employee referred to in our Response to Citation #6 was also responsible for conducting the March through July surveys. Although he performed them, he failed to reduce his data and findings to the standard form we use for this purpose, and he was some months behind in this paperwork when he left our employment. Despite our numerous attempts, he never did provide the appropriate documentation. However, during the inspection, your inspectors were provided with a document certifying that he conducted the surveys and that no contamination was found.

VII.2 This is another instance where a true performance-based inspection would recognize the effectiveness of the program and forgive the minor transgression on the paperwork.

Corrective Action

VII.3 Floor surveys conducted from October 1998 onward have been documented and records are available for inspection, a corrective action taken 6 months before the MDE inspection.

VII.4 In view of all the circumstances, Citation 7 appears to be a rather egregious example of citation inflation, and we respectfully request that it be rescinded.

VIII. Citation #8 states:

"License Amendment 33, Item I and NPI's Random Inspection Program dated May 14, 1993 requires in part that the Radiation Safety Officer implement random inspections of the LAA and unrestricted areas on a monthly basis.

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Contrary to Section C.31 and license amendment 33, a monthly audit of the LAA was not conducted as required for August 1998. This is a REPEAT violation from the April 29-30, 1997 Departmental Inspection. The RHP is further concerned that the Random Inspection Program is still not effective in resolving items of noncompliance and radiation safety concerns."

Response

VIII.1 The purpose of the monthly audits is to ensure that company management periodically reviews some portion of the operations in the LAA. Due to the then-recently completed melting campaign and subsequent hot cell clean-up, there had been an inordinato level of management oversight in the LAA, thereby vitiating the need for even more management presence within the LAA and exacerbating the need for management attention elsewhere.

VIII.2 We also take issue with RHP's statement that the program is not effective. We have been telling RHP for years that the program has outlived its original purpose and should be modified. Since MDE will not permit us to modify the program without its prior approval, we sent MDE a draft of a revised program on July 28, 1998. RHP dismissed our proposal out of hand at the management conference held one year ago this week.

VIII.3 We have tried to act constructively to revitalize the existing program; we have been reasonably successful in that regard; and a review of the monthly inspection reports and quarterly reviews will show that we have even addressed, with corrective action, some of MDE's stated concerns.

Corrective Action

VIII.4 Although we believe the current program can be improved along the lines suggested last summer, it is effective in its current mode for what it was designed to do, and its implementation is consistent with the conditions in our license. MDE has been receiving the monthly letters certifying that the monthly audits have been performed and that the reports have been written, as outlined in our letter of November 25, 1998, and all required inspections and quarterly reviews have been conducted from October 1998, onward.

VIII.5 As noted last year by Mr. Williams, he thinks the program can be improved; and in view of all the citations it has evoked, I do not understand your reluctance to either review, and comment upon his approach, or give us a free hand to use our own judgment. Considering that we have no record of the Department's approval of the program we drafted more than six years ago, and in view of the fact that our conduct of it has been the source of numerous citations, I fail to understand why it has become so holy that it can't be upgraded? Please explain in writing.

VIII.6 Meanwhile, on the merits, there is no substance to Citation #8. Rather, it appears to be a vintage example of citation inflation, and we respectfully request that you rescind it.

NEUTRON PRODUCTS inc

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VIII.7 We would be pleased to discuss with you the program modifications, as outlined in our draft of July, 1998, or any improvements you may wish to suggest. Until then, it appears that no further corrective action is appropriate, and none is contemplated. Kindly confirm your concurrence.

IX. Citation #9 states:

"License Amendment 33 Item D.8 and NPI's one kilometer survey plan requires in part that the licensee conduct monthly surveys of residential properties located within the one kilometer radius of the plant.

Contrary to Section C.31 and the one kilometer survey plan approved by the RHP and license amendment 33, radiological surveys of residential properties located within the one kilometer radius of the plant were not conducted in June and July 1998. Furthermore, the majority of the residential properties in this area have never been surveyed for radiological contamination."

Response

IX.1 At MDE's request, a flyover of NPI's facility and the surrounding areas was conducted by DOE/NRC in late 1993 for the advertised purpose of discerning the location and frequency of off-site contamination. The survey was conducted over a 42 square kilometer area. Despite the fact that a very sensitive crystal was used, no contamination was found outside a radius of approximately 300 m around the plant. Nor was any contamination found within the 300 m radius, although it was determined that the background levels from the plant were such that they would mask any low level contamination within that area.

IX.2 Armed with this information, and coupled with the fact that our own data of previous community surveys made it very clear that most of the spots of contamination had been found on a few properties primarily downwind of the plant, we saw no need to change our previously devised survey strategy, the purpose of which was not necessarily to cover the most area, but rather to find and remove even inconsequential levels of contamination. This is not to say that we conducted all of our surveys in one area. Rather, as provided by the Plan, we used the results of our findings close to the plant to help determine the locations for subsequent surveys further away from the plant.

IX.3 In addition, we would occasionally survey a property not in the general direction of most of our findings. Although we rarely locate contamination on such surveys, we follow any leads developed when we do, as prescribed in the plan. Over the years, we have been finding fewer and fewer spots and we have recently started to expand the radius of such surveys. Although we have never proposed to survey all properties (or even most of them), we have advertised a willingness to respond to specific survey requests, and we have often done so.

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IX.4 We have found that a number of residents contacted do not wish us to survey their property, and some have told us that MDE had already conducted surveys. In order to expand our data base and to assist with our planning of surveys we would appreciate receiving from RHP any data they have collected in the course of conducting property surveys in the Dickerson area.

Corrective Action

IX.5 In recent months, we have surveyed properties which we had not previously surveyed and we intend to continue to do so on a regular basis. Surveys have been timely and complete since August of 1998.

IX.6 Cathy Bupp has been conducting the surveys, often accompanied by Danny Wineholt.

X. Citation 10 states:

"Section D.401 titled, "Testing for Leakage or Contamination of Sealed Sources", and license condition 12 requires, in part, that each sealed source with a half-life greater than 30 days be leak tested at intervals not to exceed six months.

Contrary to the requirements of Section D.401 and License Condition 12, the licensee failed to test each sealed source for leakage or contamination within the required six (6) month frequency. Specifically, the licensee did not conduct any leak tests of their sealed source inventory (sources not transferred to an authorized recipient) during the year of 1998, a time period greater than six months. Additionally, leak tests were not conducted in 1999 until the day the inspectors requested access to these records for examination."

Response

X.1 Of the dozens of routine health physics and radiation safety tasks which we are required, either internally or externally, to conduct on a regular schedule, the vast majority were quickly reassigned to alternative personnel after our staffing disruption. Unfortunately, the semi-annual leak tests were overlooked.

X.2 Upon resumption of leak testing, no evidence of failed encapsulation was found.

Corrective Action

X.3 Conduct of the leak tests has been reassigned to Danny Wineholt under the supervision of Jeff Corun and Dick Demory. A leak testing schedule has been entered in our computerized "corporate calendar", a task scheduling and reminder program.

XI. Citation 11 states:

"Section D. 1104 titled "Records of Tests for Leakage or Contamination of Sealed

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Sources" requires in part that records of leak tests required by Section D.401 shall be maintained for inspection by the Agency. Section A.4 titled, "Records" requires in part that each licensee shall maintain records showing the receipt, inventory, transfer, and disposal of all sources of radiation. Section A.5 titled "Inspections" requires in part that each licensee shall make available, upon inspection by the Agency, records maintained pursuant to these regulations.

Contrary to Sections D.1104, A.4 and A.5, records of leak tests, which were conducted during the years of 1990 to 1997, were not available for inspection. Additionally, records of shipments, receipt and transfer of radioactive sources were not adequate and readily available for inspection. Inventory of radioactive materials was maintained in a computerized database, which evidently was not updated and maintained on a regular or frequent basis. As a result, these records were not readily available for inspection in a timely manner in that NPI spent several hours creating material inventory record when it was requested by RHP inspectors for review."

Response

X.1 As stated above, we suffered a health physics staffing disruption in 1998. During this period, records of leak tests for the period in question, normally housed in the health physics office, were mislaid. They have since been recovered.

XI.2 As MDE knows, we have detailed records of radioactive material shipped and received, and those records are kept in the appropriate customer files because, for most purposes, that is the most efficient place for us to keep them.

XI.3 However, we recognize that this filing system does not make for efficient inspections. As a result, we have started a new logbook which maintains our running inventory and records the amount of cobalt-60 received and whence it came, as well as the amount of cobalt-60 shipped and where it went. We believe that this will improve the efficiency of subsequent MDE inspections."

Corrective Action.

XI.4 Maintenance of the aforementioned logbook will be performed by Ed DeRosa and shall be updated on a schedule no less often than monthly.

XII. Citation 12 states:

"Section D.1108 titled, "Records of Dose to Individual Members of the Public" requires in part that each licensee maintains records sufficient to demonstrate compliance with Section D.301, which describes the dose limit for individual members of the public.

Contrary to Section D.1108, the licensee failed to maintain records sufficient to

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6 August 1999
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demonstrate compliance with the 100 millirem per year dose limit for individual members of the public for the year of 1998. At the exit interview, the Radiation Safety Officer described the manner in which NPI can demonstrate compliance with Section D.301 titled, "Dose Limits for Individual Members of the Public". However, a written document describing this evaluation or a record demonstrating compliance by measurement, calculation or appropriate simulation model, using recent radiation monitoring data, was not available for review during the inspection."

Response

XII.1 For the year 1996, we prepared an analysis of public exposure to the most highly exposed cohort. This analysis was based on interviews with the individual, plus surveys and some TLD data. The analysis assumed that the individual spent the majority of his time indoors, which was based on information supplied by him. As a conservative assumption, we placed a TLD in the highest dose rate area of the house and further assumed that the individual spent 100% of his time at that spot.

XII.2 For the year 1997 (the first year for which complete dosimetry data was available) we included our analysis in our annual report using the same conservative assumptions and methodology.

XII.3 For the year 1998, we collected and reviewed similar TLD data, and it was our intention to provide a written review in the 1998 annual radiation protection program review, as we had done in 1997. At the time of inspection the annual review was still in preparation. However, the dosimetry data was supplied to and reviewed by your inspectors, clearly demonstrating compliance with D.301 by D.302B.11.1).

XII.4 Please cite the passage from COMAR requiring written analysis.

Corrective Action

XII.5 The written analysis described above will be included in annual review of the radiation protection program, which will be performed by Jeffrey Williams and is scheduled to be completed later this month.

XIII. Citation 13 states:

"License amendment 33, item 13.L dated May 23, 1989 requires in part that the radiation levels at the boundary of the facility shall not exceed 500 millirem per year.

Contrary to Section C.31 and license amendment 33, the licensee failed to comply with the 500 millirem per year boundary limit. The RHP measured 531 millirem at the fence of the dry pond for the year of 1998."

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XIII.1 This license condition has been an issue of contention since its imposition on Neutron's license in 1989. Several years ago, MDE wrote to the NRC requesting guidance, and the NRC confirmed Neutron's position that an evaluation of the potential levels of exposure to members of the public was important in determining whether the excessive stringency of such a condition was justified (the limit is less than 3% of the regulatory limit which applies to all licensees in the United States, including those of us in the State of Maryland). MDE ignored this guidance, despite the fact that Neutron's evaluation showed that no member of the public could reasonably be expected to receive more than a few millirem per year from the point at the site boundary where the 500 mrem per year license limit had been exceeded.

XIII.2 Moreover, if MDE would subtract the contribution of natural background radiation so that the measurement truly reflected Neutron's contribution to the total, then Neutron would be under RHP's 500 millirem per year requirement by both your measurement and ours.

XIII.3 Our own dosimetry for the area in question demonstrates compliance, although the first quarter dosimeter was discovered missing and we had to interpolate data for the period.

XIII.4 Under the NVLAP program, a dosimetry provider qualifies by demonstrating an accuracy of $\pm 25\%$. As RHP is undoubtedly aware, thermoluminescent dosimetry is subject to random errors and statistical variation. RHP's claim of a 6% excess at a single location should be taken in that context, and may well be an anomaly.

Corrective Action

XIII.5 Despite Neutron's objections to the excessively stringent condition, Neutron continues to try to comply with it. Hopefully, the reorganization of the North Waste Room and the remediation of the area downstream of the rip-rap on the discharge side of the dry pond, which are both contemplated for execution within the next few months, are expected to make significant contributions in this regard. Both projects will be conducted under the supervision of Jeffrey Williams.

XIII.6 However, in evaluating the significance of both the alleged violation and the remedy, it should be noted that no individual is likely to be exposed to as much as 1 mRem per year as a result.

XIII.7 With all due respect, we suggest that you either rescind the citation or explain to us why you consider it to be either important or legal for you to impose a License Condition that is less than 3% of the statutory requirement.

We would appreciate the benefit of a prompt and favorable reply.

Very truly yours,
Neutron Products, Inc.

J. A. Ranschoff, President

NEUTRON PRODUCTS Inc

10/4/99067

NEUTRON PRODUCTS inc

22301 Mt. Ephraim Road, P. O. Box 68
Dickerson, Maryland 20842 USA
301-349-5001 FAX: 301-349-2433

30 September 1999

Mr. Carl Trump
Radiological Health Program
Maryland Department of the Environment
2500 Broening Highway
Baltimore, MD 21224

Re: MD-31-025-01

Dear Mr. Trump,

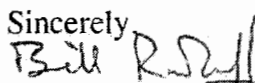
I am writing to certify that I conducted the random inspection for the month of August on August 10 and 11, 1999 and that the report is available for your review. In addition, I have enclosed Bob Alexander's monthly report for August, 1999.

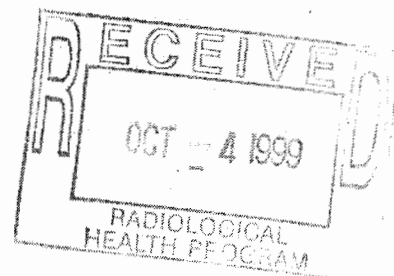
In order to fulfill our requirements under License Condition 15C of the new license, I have consulted with Jeffrey Williams, the Radiation Safety Officer for the 01 license. In the month of August, there was one HECM incident exceeding 22,000 dpm. A count of 27,900 dpm was recorded on the afternoon of August 26 and involved employee #515 who had been working in the room behind the hot cell. He used a frisker to determine that the contamination was on his neck. He decontaminated himself to background by washing the affected area. As you are aware, the area behind the hot cell is in a contamination control zone and it is not unexpected that events such as this will occur from time to time. Jeff's evaluation determined that the additional dose to the skin would have been no more than 15 mrem, which is 0.03% of the regulatory limit of 50,000 mrem.

The HECM operated properly during the month, although the print-out of records on August 2 was affected by an earlier power outage. Timely interviews with employees uncovered no unusual HECM events that day.

In accordance with Condition 22.B.2, during the month of August, contaminated soil was found in the drain at the west end of the courtyard (8/10/99) and in the stone baskets at the discharge side of the dry pond (8/4/99). Both areas were subsequently cleaned and the soil and debris placed in a B-25 with other contaminated soil. The off-site survey yielded no findings of contamination.

If you need additional information, please let me know.

Sincerely

W.L. Ransohoff



HP CONSULTANT REPORT FOR AUGUST 1999

Introduction

I visited NPI on August 30, 1999, to conduct an audit of the LAA and hold discussions with RSO Jeff Williams. Several improvements in radiation protection were observed, and others are in progress. I did not identify any new problems.

1.0 Improved Containment for Soil

A problem previously mentioned in these pages has been nicely solved. Several very large polypropylene supersacks filled with slightly contaminated soil, stored in the courtyard, have been transferred to new, metallic-walled B-25 containers purchased for that purpose (\$600 each). Since the weathered bags were beginning to tear easily, this timely action has prevented any significant release of radioactivity. Also, the soil can now be readily moved from one place to another by forklift, making it available for temporary shielding. Such shielding is used effectively in the courtyard to reduce dose rates both on- and off-site. The problem of "identification tag" fading, previously described, is being resolved as well. A stencil is being prepared which will allow permanent painting of the necessary information on each B-25.

2.0 Protective Clothing

One of the contamination-control methods that I have become accustomed to over the years is a simple technique intended to keep careless people who work in a contaminated area from transferring contamination into areas supposed to remain contamination free. This technique is not employed at NPI. The reason I am calling attention to it here is *not* survey records showing any cause for concern. My reason is primarily precautionary for a problem that has developed elsewhere and could develop here.

The technique is simply: (1) to allow protective clothing to be worn only in work areas where contamination is allowed (already in practice at NPI); and (2) to use distinctive protective clothing colors as the way to quickly identify infractions of this rule. This technique, I believe, is worthy of reconsideration by NPI management.

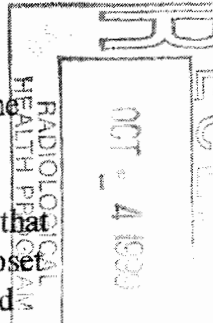
RADIATION
PROTECTION

at

NEUTRON
PRODUCTS

3.0 Dose Rate Outside LAA

The closet of a large workshop outside the LAA shares a wall with the north waste room. Although this wall provides considerable concrete shielding I noticed that the dose rate posted at the door to the closet is 3 mR/h. Additional shielding (described below) has been constructed and is to be



installed in connection with the reorganization of the north storage room contents.

4.0 Increased Shielding for Radioactive Waste

RSO Jeff Williams, et al., are still preparing for reorganization of north and south waste room contents. This reorganization will provide improved utilization of storage space and reduce courtyard dose rates. New shields to be placed inside the north room, against the back (east) wall, are almost completed. These four L-shaped (6000 lbs each) shadow shields are composed of welded ¼" steel plates, filled with concrete. They will provide 12" of shielding across the entire back wall, to a height of 10'. In addition, 4'-long right-angle extensions at both ends of these shields will provide 6" of shielding, also floor to 10', along the north and south walls.

The initial objectives of this shielding are to permit repositioning of the drum-shields stored in the north room:

- (1) without increasing off-site doses to members of the public;
- (2) without increasing the dose rates in occupied office areas a short distance beyond and east of the waste storage building;
- (3) in a manner to maximize protection for the second-floor lobby;
- (4) without increasing the dose rate in the area outside the back wall to a level exceeding 2 mR/h;
- (5) without increasing the dose rates in the adjacent weld shop closet.

The shield sections can be readily moved by forklift and will be useful after final disposition of the Co-60.

5.0 Waste Compactor

NPI has submitted an application for a

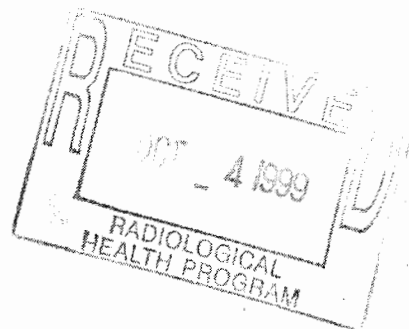
licence amendment to acquire and operate a dry radioactive waste compactor. One is presently available which generates 85K lbs/in², providing volume reduction in the range 3-to-1 to 6-to-1. A spring-loaded disk is used to prevent re-expansion before sealing. Jeff Williams thinks that up to ½ of the south-room vault space can be reclaimed using the compactor.

6.0 Hot Tool Room

The current plan is to load everything in the hot tool room that is no longer used into a drum-shield and store it in the newly reorganized north waste room.

7.0 "Navy" Source Replacement

Jeff Williams plans to replace the 'Navy' calibration source with a 3- to 5-Ci Co-60 source to be constructed at NPI. The source strength would not be accurately known, but the dose rates at desired locations would be measured using an instrument calibrated with a source traceable to NBS.





MARYLAND DEPARTMENT OF THE ENVIRONMENT

2500 Broening Highway • Baltimore Maryland 21224
(410) 631-3000 • 1-800-633-6101 • <http://www.mde.state.md.us>

Parris N. Glendening
Governor

Jane T. Nishida
Secretary

JUL 14 1999

CERTIFIED MAIL: NOTICE OF VIOLATION

Jackson A. Ransohoff, President
Neutron Products Inc.
22301 Mount Ephraim Road
Dickerson, Maryland 20842

RE: Radioactive Material License Number: #MD-31-025-01

Dear Mr. Ransohoff:

This letter refers to the radioactive materials inspection conducted by Messrs. Bob Nelson, Alan Jacobson, and Ray Manley of the Maryland Department of the Environment's (MDE) Radiological Health Program (RHP) on March 16, 18, and 19, 1999. The inspection examined radiation safety, compliance with conditions of your license, adherence to procedures and proper maintenance of records, interviews with personnel, general observations, and independent measurements.

During the inspection, certain activities were found to be in violation of the Department's requirements. The findings were either discussed with Messrs. Marvin Turkanis, Jeffrey Williams, and Billy Ransohoff at the licensee management exit interview conducted on March 19, 1999 and with Mr. Jeffery Williams by telephone on May 18, 1999. The violations found are listed in the enclosed "Description of Violations."

In addition to the violations found, the RHP has identified the following programmatic issues and radiation safety concerns:

1. NPI personnel have still not demonstrated National Institute of Standards and Technology (NIST) traceability of your calibrator source (Cobalt-60, M-498, 6.10 millicuries) which they use to calibrate approximately 65 radiation survey meters and 46 self reading dosimeters. This issue of concern was identified during the March 25, 26 and April 2, 1998 radioactive material inspection, and described in the Department's June 30, 1998 letter, and still remains unresolved. Furthermore, NPI personnel could not demonstrate the accuracy of their conductivity meter. Finally, NPI did not possess or use a calibration standard, and a calibration record was not available for inspection.

2. The licensee has still not obtained the permits necessary to begin construction of the courtyard enclosure. Radiation levels at the boundary of the plant and concentrations of cobalt-60 in soils exceed regulatory requirements. NPI has been storing the radioactive waste that was generated as a result of source manufacturing activities. In fact, NPI has only shipped for disposal, a small fraction of the radioactive waste that it has generated over the past three decades.
3. NPI continues to have unresolved compliance issues and radiation safety concerns regarding all four of your Maryland radioactive materials licenses. Furthermore, NPI does not have a full time Health Physicist on staff and your Health Physics Consultant, who only spends a few days per month on site, has not been effective in resolving these issues and concerns. The Department is concerned because it appears that NPI management does not have the technical expertise, financial resources and commitment towards radiation safety to effectively implement critical aspects of an adequate radiation protection program necessary to establish compliance with State Regulations and license conditions.
4. The Limited Access Area (LAA) of the plant, equipment, tools, storm water system, dry pond, adjacent railroad property and soils, both on and off site, are contaminated with cobalt-60. The RHP estimates that it will cost millions of dollars to remediate contaminated areas of the plant and property. Your company filed for bankruptcy protection in 1986 and evidently, your debts still remain unresolved. NPI has still not met financial assurance requirements for decommissioning in regards to three of your Maryland radioactive materials licenses to which the regulation pertains. Finally, your company does not maintain adequate documents which describe your radioactive waste management plan or plan of corrective action regarding the dozens of ongoing violations of Maryland radiation protection regulations and programmatic radiation safety concerns.

As a result of these findings, you are required to respond to this letter and the enclosed "Description of Violations" within twenty (20) calendar days of your receipt of this notice. Written statements should be provided for each of the violations indicating:

- a. Corrective steps, which have been or will be taken by you to remedy the present violations and the results achieved or anticipated;
- b. Corrective steps which will be taken to avoid further violations, who will undertake these steps, and who will supervise them; and
- c. The date when full compliance will be achieved.

Failure to provide these statements in the required time frame may result in the Department taking escalated enforcement action under Maryland Radiation Regulations to:


- (a) modify, revoke or suspend your license,

- (b) issue a Departmental Order under the Annotated Code of Maryland, Environment Article, Sections 1-301 and 8-101 through 8-601, and
- (c) seek an administrative penalty of up to \$1,000 per violation, per day [Section 8-510(b)], or a civil penalty in an amount not exceeding \$10,000 per violation, per day [Section 8-509(b)].

The serious nature and the extent of the deficiencies noted with your radiation safety program requires that you schedule an enforcement conference at the Agency's headquarters no later than thirty (30) days after your receipt of this letter, at which time, upon review of your compliance response, remedial actions can fully be discussed. Please indicate in your response who will be attending the meeting representing NPI.

Please be reminded that Departmental compliance letters and licensee responses shall be posted pursuant to the requirements of the Maryland regulations, Section J.11(d) titled, "Posting of Notices to Workers." Should you have any questions concerning this letter, please contact Messrs. Carl E. Trump, Jr., Bob Nelson, or me, at (410) 631-3301.

Sincerely,



Roland G. Fletcher, Environmental Manager
Radiological Health Program

CET
RGF/CET/RKN/cc

Enclosure: Description of Violations

DESCRIPTION OF VIOLATIONS

Neutron Products Inc.
22301 Mount Ephraim Road
Dickerson, Maryland 20842

RE: Radioactive Material License Number: MD-31-025-01

Certain activities conducted under your license were found to be in violation of the Code of Maryland Regulations 26.12.01.01 titled, "Regulations for Control of Ionizing Radiation." These violations are presented below:

1. Section D.501 titled "Surveys and Monitoring-General" requires in part that each licensee shall conduct surveys that are necessary to evaluate radiation levels and concentrations of radioactive material. License amendment 33, Item N dated May 23, 1989 requires in part that all soils exhibiting levels of radioactivity in excess of 8 picocuries per gram above background, for an equivalent area of 30 ft by 30 ft wherever found, shall be removed and properly stored/disposed of by the licensee. The gamma exposure rate at one meter above the ground surface shall not exceed 10 microR/hr above background for an area greater than 30 ft by 30 ft and shall not exceed 20 microR/hr above background for any discrete area.

Contrary to the requirements of Section D. 501 and license amendment 33, the analyses of soil samples collected by RHP Inspectors from the dry pond and the adjacent railroad property collected on March 16 and 18, 1999 indicate that the soil concentration for cobalt-60 contamination exceeded 8.0 picocuries per gram. These contaminated areas of the dry pond and the adjacent properties are greater than 30 ft by 30 ft. The licensee failed to conduct soil samples and analysis to accurately determine the status of compliance during the years of 1997 and 1998. During the inspection, RHP Inspectors collected random soil samples from the far side of the dry pond and the adjacent railroad property. The samples were analyzed by the Maryland Laboratory Administration's Radiation Chemistry Laboratory who determined the cobalt-60 soil concentrations to be 186.6 and 101.4 picocuries per gram respectively. The licensee has still not removed soil contaminated with cobalt-60 from the adjacent railroad property to establish compliance with the 8.0 picocurie per gram soil concentration limit. The Stipulation and Settlement (Civil Case No. 76639 in the Circuit Court for Montgomery County) dated January 3, 1994 required the licensee to clean all contaminated soils areas by June 15, 1994. The licensee failed to meet this deadline and is refusing to remediate this property. Furthermore, the dose rate at one meter above the ground surfaces of the dry pond and adjacent areas exceeds the

dose rate limit of 10 micro R/hr above background. The RHP has determined the dose rate at two locations at the boundary of the dry pond to be approximately 531 millirem per year and 342 millirem per year. The fence surrounding the dry pond was constructed such that it does not prevent or adequately discourage unauthorized access. During the April 1997 inspection, the RHP Inspectors found evidence that soil contaminated with cobalt-60 was removed by an unknown person other than the licensee. The licensee did not submit the design to the RHP for approval prior to construction and this issue still remains unresolved. This is a **REPEAT** and ongoing violation.

2. Section D.101, titled "Radiation Protection Programs" requires in part that each licensee shall use all means necessary to maintain radiation exposures to levels as low as reasonably achievable.

Contrary to Section D.101, the licensee failed to maintain radiation exposures to members of the public living near the plant to levels as low as reasonably achievable (ALARA). This is a **REPEAT** violation from previous inspections. The RHP measured approximately 202 millirem per year at the portico of a resident's home, 353.0 millirem per year on the lawn of a nearby resident and 150 millirem per year next to the home located on this property. The RHP has identified the waste storage rooms as the source of these elevated radiation levels in the community. NPI continues to store quantities of radioactive waste. In fact, the licensee has only shipped for disposal, a small fraction of the radioactive waste that they have generated over the past three decades.

3. Section D.501, titled, "Surveys and Monitoring-General" requires in part that each licensee make or cause to be made surveys as may be necessary to evaluate the extent of the radiation hazards that may be present and to establish compliance with these regulations.

Contrary to Section D.501, the licensee failed to conduct radiological surveys in the courtyard area of the LAA sufficient to determine the presence of leaf debris, which contained elevated levels of cobalt-60. RHP Inspectors collected a sample of this debris, which contained a cobalt-60 concentration of approximately 7704.8 picocuries per gram. The RHP has long identified this area as a potential release point where radioactive materials exit the plant in an uncontrolled manner.

4. Section D.101, titled "Radiation Protection Programs" requires in part that each licensee shall use all means to maintain radiation releases of radioactive material to levels as low as reasonably achievable.

Contrary to Section D.101, the licensee failed to use all means necessary to control releases of radioactive material from the Limited Access Area (LAA) to levels as low as reasonably achievable (ALARA). Cobalt-60 contamination continues to be found outside of NPI's boundary thus substantiating the loss of control of a hazardous

radionuclide. Two soil samples that inspectors collected from the unrestricted side of the LAA fence contained cobalt-60 soil concentrations measured to be 167.7 and 103.5 picocuries per gram. Soil samples that were collected by the railroad tracks near the road and adjacent to the fence on the outside of the drypond measured 96.3 and 21.7 picocuries per gram respectively. The soils in the dry pond and adjacent railroad property contain concentrations of cobalt-60 that exceed regulatory requirements. This is a REPEAT and ongoing violation.

5. License amendment 33, Items C.1 and C.4 requires in part that a Department approved Health Physics Consultant conduct monthly evaluations and submit monthly reports to the Department based upon such evaluations. Section C.31 titled "Specific Terms and Conditions of Licenses" requires in part that each licensee shall be subject to all rules, regulations and orders of the Agency.

Contrary to Section C.31 and license amendment 33, the licensee failed to submit the Department Approved Health Physics Consultant's monthly reports to the Agency during the third and fourth quarters of 1998 as required. This is a REPEAT violation from prior inspections.

6. Section D.501 titled "Surveys and Monitoring-General" and license amendment 33, item D.6 requires in part that the licensee shall conduct monthly floor monitoring within the entire facility.

Contrary to Section C.31, Section D.501 and license amendment 33, monthly floor surveys of the plant were not conducted in August and September 1998.

7. Section D.1103 titled, "Records of Surveys" requires in part that each licensee shall maintain records of the results of radiation surveys required to demonstrate compliance with regulatory limits and item D.6 of license amendment 33:

Contrary to Section C.31 and D.1103, records of the floor monitoring surveys, which were conducted during the months of March-July, 1998, were not maintained or available for inspection.

8. License Amendment 33, Item I and NPI's Random Inspection Program dated May 14, 1993 requires in part that the Radiation Safety Officer implement random inspections of the LAA and unrestricted areas on a monthly basis.

Contrary to Section C.31 and license amendment 33, a monthly audit of the LAA was not conducted as required for August 1998. This is a REPEAT violation from the April 29-30, 1997 Departmental Inspection. The RHP is further concerned that the Random Inspection Program is still not effective in resolving items of noncompliance and radiation safety concerns.

9. License Amendment 33 Item D.8 and NPI's one kilometer survey plan requires in part that the licensee conduct monthly surveys of residential properties located within the one kilometer radius of the plant.

Contrary to Section C.31 and the one kilometer survey plan approved by the RHP and license amendment 33, radiological surveys of residential properties located within the one kilometer radius of the plant were not conducted in June and July 1998. Furthermore, the majority of the residential properties in this area have never been surveyed for radiological contamination.

10. Section D.401 titled, "Testing for Leakage or Contamination of Sealed Sources", and license condition 12 requires, in part, that each sealed source with a half-life greater than 30 days be leak tested at intervals not to exceed six months.

Contrary to the requirements of Section D.401 and License Condition 12, the licensee failed to test each sealed source for leakage or contamination within the required six (6) month frequency. Specifically, the licensee did not conduct any leak tests of their sealed source inventory (sources not transferred to an authorized recipient) during the year of 1998, a time period greater than six months. Additionally, leak tests were not conducted in 1999 until the day the inspectors requested access to these records for examination.

11. Section D. 1104 titled "Records of Tests for Leakage or Contamination of Sealed Sources" requires in part that records of leak tests required by Section. D.401 shall be maintained for inspection by the Agency. Section A.4 titled, "Records" requires in part that each licensee shall maintain records showing the receipt, inventory, transfer, and disposal of all sources of radiation. Section A.5 titled "Inspections" requires in part that each licensee shall make available, upon inspection by the Agency, records maintained pursuant to these regulations.

Contrary to Sections D.1104, A.4 and A.5, records of leak tests, which were conducted during the years of 1990 to 1997, were not available for inspection. Additionally, records of shipments, receipt and transfer of radioactive sources were not adequate and readily available for inspection. Inventory of radioactive materials was maintained in a computerized database, which evidently was not updated and maintained on a regular or frequent basis. As a result, these records were not readily available for inspection in a timely manner in that NPI spent several hours creating material inventory record when it was requested by RHP inspectors for review.

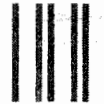
12. Section D.1108 titled, "Records of Dose to Individual Members of the Public" requires in part that each licensee maintains records sufficient to demonstrate compliance with Section D.301 which describes the dose limit for individual members of the public.

Contrary to Section D.1108, the licensee failed to maintain records sufficient to demonstrate compliance with the 100 millirem per year dose limit for individual members of the public for the year of 1998. At the exit interview, the Radiation Safety Officer described the manner in which NPI can demonstrate compliance with Section D.301 titled, "Dose Limits for Individual Members of the Public". However, a written document describing this evaluation or a record demonstrating compliance by measurement, calculation or appropriate simulation model, using recent radiation monitoring data, was not available for review during the inspection.

13. License amendment 33, item 13.L dated May 23, 1989 requires in part that the radiation levels at the boundary of the facility shall not exceed 500 millirem per year.

Contrary to Section C.31 and license amendment 33, the licensee failed to comply with the 500 millirem per year boundary limit. The RHP measured 531 millirem at the fence of the dry pond for the year of 1998.

UNITED STATES POSTAL SERVICE

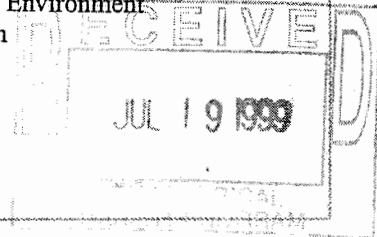


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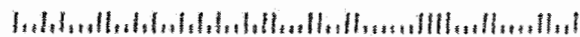
Radiological Health Program

2500 Broening Highway

Baltimore, Maryland 21224

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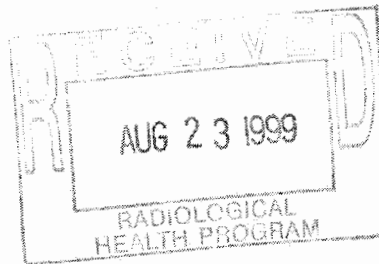


NEUTRON PRODUCTS inc

22301 Mt. Ephraim Road, P. O. Box 68
Dickerson, Maryland 20842 USA
301-349-5001 FAX: 301-349-2433

18 August 1999

Mr. Carl E. Trump, Jr.
Program Manager
Radioactive Materials Licensing
and Compliance Division
Maryland Department of the Environment
2500 Broening Highway
Baltimore, MD 21224



Dear Mr. Trump:

I am writing to inform you that we intend to store packaged contaminated soil in locked sea containers outside the Limited Access Area. The dose rate in any unrestricted area around the containers will not exceed 2 mrem/hr, as specified in COMAR D.301.a.ii, and the containers will be posted in accordance with COMAR D.902.

As you are aware, the soil itself does not present any radiological hazard and its activity is so low that we routinely use it for shielding purposes. The storage of contaminated soil in this manner is in the interest of Neutron, RHP and the community because it provides for efficient storage of contaminated soil generated by past and future remediations of the dry pond, rail siding, etc. Furthermore, with several drums and B-25's removed from the courtyard, we will be better able to effectively police the area for leaves, dirt, and debris, which have been of great concern to RHP in the past.

Although we believe this storage to be consistent with the regulations and our existing license, Condition 21.B.1 of the proposed license provides that:

"Any radioactive waste storage, either temporary or long term shall only be located in the LAA with the only exception being the underground waste water storage tank..."

We do not believe this provision was intended to address contaminated soil. Please confirm that our intended storage of contaminated soil in the manner proposed herein is consistent with the proposed license.

Sincerely,

NEUTRON PRODUCTS, INC.

W.L. Ransohoff
W.L. Ransohoff

MARYLAND STATE DEPARTMENT OF THE ENVIRONMENT
RADIOLOGICAL HEALTH PROGRAM

Radioactive Materials Inspection Format

A. General

1. NAME OF LICENSEE: Neutron Products, Inc. (NPI)
ADDRESS: 22301 Mount Ephraim Road
P.O. Box 68
Dickerson, Maryland 20842
SITE LOCATION(S): same as above
TELEPHONE NUMBER: (301) 349-5001
2. INSPECTION DATE: March 16, 18, and 19, 1999
3. TYPE OF INSPECTION: Announced/reinspection
4. TYPE OF INVESTIGATION: N/A
5. LICENSE NUMBER: MD-31-025-01
NUMBER AND DATE OF LAST AMENDMENT FOR EACH LICENSE: #42, dated 4/27/95
INSPECTION PRIORITY AND CATEGORY FOR EACH LICENSE: (Q) (02305)
6. DATE OF PREVIOUS INSPECTION: March 25, 26, and April 2, 1998
7. PURPOSE AND SCOPE OF INSPECTION: To examine the licensee's use and control of Radioactive Material relative to Maryland regulations for the use and control of ionizing radiation, license conditions, and submitted radiation safety procedures.
8. INSPECTORS: Robert K. Nelson
Robert K. Nelson, Health Physicist,
Alan D. Jacobson, Health Physicist, and
Ray Manley. Health Physicist
- DATE OF REPORT: April 16, 1999
9. REVIEWER: Carl E. Trump, Jr.
Carl E. Trump, Jr., Environmental Program Manager
Radioactive Material Inspection and Enforcement
- DATE OF REVIEW: 8/10/99

This is the second review of this report as it has edited by R. Nelson. C&T

10. FUTURE INSPECTION FREQUENCY: September 1999

11. PREVIOUS NONCOMPLIANCE AND PRESENT STATUS:

open means NOT
CORRECTED?
Yes

The previous inspection found five violations:

1. Monthly audits missing - open
2. Cobalt-60 soil limits exceeded - open
3. Storage and control - open
4. Labeling of containers - corrected
5. Recordkeeping for decommissioning - open

12. ITEMS OF NONCOMPLIANCE NOTED DURING THE INSPECTION:

- | | | | |
|--|--------|------|---|
| 1. ✓ Dry pond and railroad property soil exceed limits | L/C 13 | B.10 | ✓ |
| 2. ✓ Radiation dose ALARA for members of public near plant | D.101 | B.10 | ✓ |
| 3. ✓ Failure to perform surveys of the courtyard | D.501 | B.11 | ✓ |
| 4. ✓ Release of radioactive material from plant | L/C 13 | B.11 | ✓ |
| 5. ✓ Monthly reports not submitted | C.31 | B.13 | ✓ |
| 6. ✓ Monthly floor surveys not performed | C.31 | B.13 | ✓ |
| 7. ✓ Records of surveys not maintained | D.1103 | B.13 | ✓ |
| 8. ✓ Audit of Limited Access Area missing | C.31 | B.13 | ✓ |
| 9. ✓ One kilometer environmental surveys not done | C.31 | B.13 | ✓ |
| 10. ✓ Leak tests exceeded six month frequency | D.401 | B.14 | ✓ |
| 11. ✓ Leak test records and inventory not available | A.4 | B.14 | ✓ |
| 12. ✓ Records for dose to public not maintained | D.1108 | B.10 | ✓ |
| 13. ✓ Exceeding 500 millirem boundary limit | C.31 | B.10 | ✓ |

13. INCIDENT SINCE THE LAST INSPECTION:

Several incidents of contamination on LAA workers were reported to this Agency since the last inspection as required.

14. LICENSEE MANAGEMENT EXIT INTERVIEW: The management exit interview was held with Messrs. Marv Turkanis, Jeff Williams, Billy Ransohoff, Alan Jacobson, and Bob Nelson on March 19, 1999. The violations and items of concern were discussed. Form MDER-E1 was issued with a letter to follow.

15. LICENSEE MANAGEMENT COMMENTS: Mr. Williams signed the inspection form.

16. NEEDED CHANGES TO THE LICENSE: None.

B. Report Details

1. INSPECTION PARTICIPANTS: Jeff Williams, Marv Turkanis, Jo Tang, John Vernon, Less Demory, Matt Repp, Jeff Corun, Danny Wineholt, Kathy Bupp, Alan Jacobson, and Bob Nelson.

Bob : REGARDING ITEM 14, - "ITEMS OF CONCERN"
 (1) where are these discussed in your report?
 (2) Please summarize them or paraphrase them and include

2. **PROGRAM - (SCOPE OF LICENSE, DEVIATIONS FROM LICENSE):**

NPI manufactures Cobalt-60 radiation sources. They receive shipments of Cobalt-60 from nuclear power plant reactors and form it into slugs that are used for teletherapy or irradiator sources. The shaping of the slugs involves melting them and is done in their Hot Cell. NPI also makes sources out of several old Co-60 sources. Most of their business is for teletherapy cancer treatment. They recondition teletherapy units and put fresh sources in them.

3. **ORGANIZATION - (MANAGEMENT RESPONSIBILITY, LICENSE IN OVERALL STRUCTURE, RADIOISOTOPE COMMITTEE, R.S.O., AND AUTHORIZATION):**

President	Jackson Ransohoff
Vice President	Marvin Turkanis
RSO	Jeff Williams
Hot Cell workers	Jeff Corun, Danny Wineholt Dick Demory, and Matt Repp
Exposure Records	Kathy Bupp
Drivers (and installers)	Leroy Byrd, Ed Koontz, and other contracted installers
Health Physics Consultant	Bob Alexander, CHP

4. **ADMINISTRATIVE CONTROL - (PROCUREMENT AND TRANSFER OF LICENSED MATERIALS, AND RECORD KEEPING; INTERNAL INSPECTION AND CONTROL):**

Mr. Jeff Williams is the RSO and is responsible for most of the required records. Some records regarding this license fall under the -03 license because radiation sources are transferred to the -03 license. Some records are kept in the LAA. Dosimetry records are maintained by Kathy Bupp.

5. **USE OF MATERIAL - (AS COMPARED TO LICENSE):** As authorized.

6. **FACILITIES - (ACCESS CONTROL, WARNING DEVICES, ETC.):**

Entry is controlled by receptionists with visitor film badges issued. Visitors are escorted throughout the plant. CRA signs are posted. Entry into the Limited Access Area (LAA) is restricted. Visitors need to sign in and "dress out" in protective clothing. SRDs are issued. Anyone exiting the LAA needs to remove their protective clothing, shower, and "count out" using the Helgeson whole body counter. Pancake friskers are also available.

7. **EQUIPMENT - (PROTECTIVE DEVICES):** Licensee has a well shielded hot cell inside the Limited Access Area (LAA). The hot cell is equipped with remote manipulators. The Cobalt sources are kept in a ten foot deep pool of water. Other equipment includes; shipping casks, remote handling poles, whole body quarterly and monthly dosimeters, SRDs(0-200 mRem), survey meters, radiation chirpers, and lead shielding. Licensee has about 50 survey meters.

6. **RADIATION SAFETY PROCEDURES - (PREPARATION AND CIRCULATION):**
Training for source handling, calibration, service, and installation is all on the job training. Licensee's procedures vary for the different makes and models of sources and teletherapy heads. Training records for classes given by Mr. Bob Alexander were reviewed.
9. **PERSONNEL MONITORING AND EXPOSURE:**
Monthly and quarterly TLDs are processed by Eberline. SRDs are also used. Exposure records were reviewed.
10. **EXPOSURE TO CONC. OF RADIOACTIVE MATERIALS - (ISOTOPES INVOLVED, RECORDS AND METHODS OF EVALUATION):** Licensee was cited for not keeping the radiation dose to their neighbors as low as reasonably achievable (ALARA). Most of the radiation exposure comes from the radioactive waste storage areas. TLDs posted by NPI and MDE outside and inside the closest houses were: (N/C)

Mr. Fisk's house, outside porch - 202 millirem per year
Nearby resident, lawn - 353 millirem per year
Adjacent house, outside - 150 millirem per year

Furthermore random soil samples taken from the far side of the dry pond and the adjacent railroad property and analyzed by the DHMH radiation lab showed concentrations of cobalt-60 of 186.6 and 101.4 picocuries per gram far exceeding the license limit of 8 picocuries per gram. Additionally, the dose rate at two areas near the dry pond was 531 millirem per year and 324 millirem per year exceeding the dose rate of 10 micro R/hr above background in the license condition and exceeding the 500 millirem per year limit of amendment 33. Furthermore, this area is not adequately fenced or restricted. Additionally, the licensee did not have adequate records to demonstrate compliance with the 100 millirem per year dose limit for individual members of the public for 1998. (N/C)

11. **EFFLUENTS TO UNRESTRICTED AREAS - (COMPLIANCE WITH MPC's):** A random sample of leaves and debris taken by the inspectors in the courtyard contained Co-60 particles. See lab report. Approximately 7704.8 picocuries per gram of cobalt-60 were ready to be blown out of the yard by the wind. This open courtyard has been identified as a release point for radioactive material effluents. The licensee was cited for failure to conduct radiological surveys of the courtyard area of the LAA. (N/C)

RHP found leaves and debris.

12. **DISPOSALS - (BURIALS, INCINERATION, ETC.):** The Cobalt-60 sources are recycled by the licensee. There are old Cobalt-60 sources in the pool. There have been no actual disposals of Co-60 sources. No bagged waste (contaminated shoe covers, disposable gloves, etc.) shipments have been made since September, 1996. Licensee stated there are still about 100 bags left in the waste storage rooms, all have dose rates greater than 200 mR/hr at contact, and some have dose rates of 15 R/hr.

13. MISCELLANEOUS SURVEYS, EVALUATIONS, & RECORDS - (EXTERNAL RADIATION LEVELS IN UNRESTRICTED AND RESTRICTED AREAS; TRANSPORT VEHICLES; CONTAMINATION LEVELS, SAFETY SURVEYS. RECORDS RELATING TO NUCLEAR MEDICINE, MEDICAL PROGRAM; INSTRUMENT CALIBRATIONS RECORDS.):

Radiation Safety Committee meeting minutes were reviewed for the last year. Some monthly environmental surveys and monthly plant floor surveys were reviewed. Other records reviewed were; Teletherapy Notice records, Shipment records, Bill of Ladings, Leak Test records, Internal QA records, Teletherapy Source Transfer records, Source Certificates, Contamination Wipes, and Meter Calibration records. Licensee was cited for failure to submit monthly Health Physics Consultants reports to the Agency as required by amendment 33. These reports had not been submitted since the second quarter of 1998. This is a repeat violation from previous inspections. Licensee was cited for monthly floor surveys not conducted in August and September 1998 and for not having records of these surveys for March to July 1998.

14. LICENSE CONDITIONS - (REVIEW OF SPECIAL CONDITIONS):

Licensee stated they maintain a running inventory by source number. However the records could not be presented in reasonable or total fashion to the inspectors. It appeared that the licensee didn't know exactly how many sources are down in the pools. The licensee was cited for not conducting a monthly audit of the LAA during the month of August 1998 as required by amendment 33. This is a repeat violation of previous agency inspections. One Kilometer radiation surveys of nearby residential properties were not conducted in June and July 1998 as required. Furthermore, the majority of residential properties in this area have never been surveyed. NPI was also cited for failure to maintain six month leak test records for their sealed sources as required. The sources were leak tested after the records were requested by the inspectors but no record were available for prior leak test results as required.

15. POSTING AND LABELLING: Agency form, "Notice to Employees, and a reference notice for the license and regulations was posted.

16. OPERATIONS OBSERVED: Hot Cell and LAA operations were observed. Observed tests of the both Irradiators fire suppressions systems on March 16, 1999. Tests were successful. See -04 and -05 files for detailed report.

17. INSPECTOR'S INDEPENDENT PHYSICAL MEASUREMENTS - (STORAGE AND USE AREAS, LEVELS IN UNRESTRICTED AREAS, WIPE TESTS, AIR SAMPLES, ETC.):

Using an E-520 with HP-270 G-M probe:
(sn 389 calibrated 9/11/98)

5 mR/hr - inside door to LAA
100 mR/hr - behind hot cell
25 uR/hr in Mr. Ransohoff's office

A leaf and soil sample was taken from the courtyard. it's dose rate was 0.5 mR/hr at contact. Twelve wipe sampled were taken in the LAA. Soil samples were taken from the Dry Pond and Railroad Track property. See attached lab reports. Licensee was again cited for the Cobalt-60 concentrations exceeding the license limit for the Dry Pond and Rail Road property.